

variation from the zero; but the act of rubbing readily gives an electromotive force equal to that of a sulphate of copper cell. As if to take the effect still further out of the category of those already recognized, M. Blondlot has verified the facts that neither the rubbing of two metals against each other, nor an isolating substance against a metal, nor two isolating substances, can produce a change in the capillary electrometer. The current flows through the electrometer from the unrubbed to the rubbed surface of the selenium. Now a thermoelectric current set up by heating a selenium-platinum junction would, of course, be in the opposite direction. M. Blondlot points out, flow through the electrometer from the hot selenium surface to the cold one, or in precisely the opposite direction; hence the novel effect cannot be due to heat developed by the friction.

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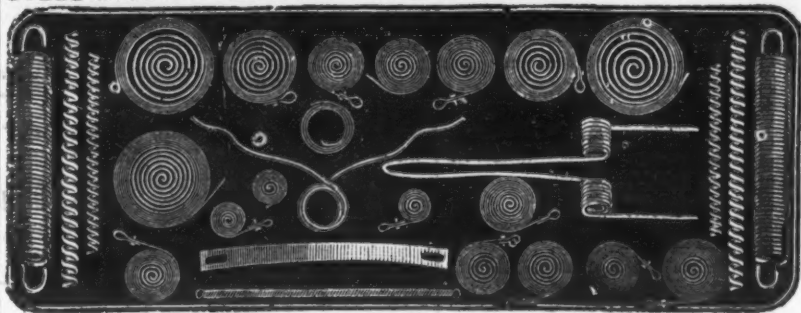
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Papers on Practical Founding.—XIV.

BY EDWARD KIRK.

BATH FOR REDUCING THE WEIGHT OF IRON PATTERNS.

Iron patterns are sometimes cast a little heavier than they should be, and to make the casting of the proper weight, the weight of the pattern must be reduced. This can be done by scraping and filing the surface of the pattern, but this requires a great deal of labor, and a much cheaper and a more even way of reducing the weight of patterns is to eat off the surface with acids. A good bath for this purpose is made of one part muriatic acid, ten parts sulphuric acid and twelve parts water. The patterns to be reduced are put into this bath and allowed to remain in it for a short time. They are then taken out, washed in clear water and weighed. If not reduced enough, they are returned to the bath and allowed to remain until they are. They are then taken out, washed in clear water, placed in an alkaline bath and allowed to remain a short time to neutralize the effect of the acid upon the iron; after which they are washed and filed and finished in the ordinary way.

BEESWAX FOR IRON PATTERNS.

Founders sometimes have considerable trouble to get pure beeswax for their iron patterns, for some farmers have a habit of adulterating their beeswax with sheep's tallow, and beeswax containing tallow cannot be used upon iron patterns, for it will not harden, and will cause the sand to adhere to the pattern rather than prevent it from doing so. To harden the beeswax so that it will give a smooth, hard surface to the pattern, various materials have been added to it by founders; among these are gutta-percha and rosin. When gutta-percha is used, it is cut or broken into small pieces, and a small amount of it is melted with the wax. It has the effect of hardening the wax and gives the pattern a hard, dark finish that works beautifully if it is properly brushed up and finished; but it requires much more labor to brush and finish a pattern coated with beeswax and gutta-percha than one coated with the pure wax, and the finish does not last any longer than the pure wax finish. When rosin is used, it is broken up and melted with the wax in the same way as gutta-percha. It has the effect of hardening the wax, and gives the pattern about the same finish as gutta-percha and wax, but it is very liable to crack and scale off, especially in cold weather, and for this reason it is but very little used. The best way to prepare wax for use in patterns, and that adopted by most founders, is to heat it to a high temperature and boil it well, to drive off any impurities it may contain, and to harden it. It is then applied to the pattern in its pure state, and will give as good a finish as if mixed with any other material that has yet been tried. Beeswax out with turpentine and made into a thick paste, has been extensively used for waxing patterns and keeping them in order while in use. This mixture is rubbed upon a hard brush and brushed upon the pattern while cold, and the turpentine soon evaporates, leaving a thin coat of pure wax upon the pattern. Some years ago, in many of the large stove foundries, every molder was supplied with a small box of this mixture and a hard brush, and was expected to keep his own patterns in order by brushing on a little of it every few days. But it was soon found that the wax would accumulate on the sides of the small ribs or other projections on the pattern, destroying the draft of the pattern and doing more harm than good. This mode of waxing patterns has therefore been abandoned as a failure.

Iron in Ohio.

In his forthcoming annual report of the Bureau of Labor Statistics, Commissioner H. J. Walls gives the following in regard to the iron interests of Ohio:

"The condition of the iron industry of the State, as represented by its furnaces, iron mills and foundries, at the close of the year 1880, is a subject for congratulation. The past 18 months have wrought wonderful change in that condition. The year 1879 opened with more than half the furnaces and iron mills closed, the immense capital invested in them bringing no returns, the thousands of workmen formerly employed therein crowding the other already crowded industries, many suffering for the necessities of life, and the prospects for the future looked gloomy indeed.

"The close of the year 1880 finds the furnaces and iron mills more generally in operation than at any time in the past eight years, and with almost double the number of persons employed that were employed in 1879, and with more employed than ever before in the history of the business in this state.

"In 1878 there were 190 blast furnaces reported to the Bureau, of which 53 were in blast, and 56 out of blast, and 5153 persons were employed. In October, 1880, there were 106 blast furnaces, of which 77 were in blast, and 29 out of blast (some of which have gone into blast since October), giving employment to 9796 persons.

"In 1878 the returns to the Bureau showed 45 firms owning rolling mills. Of these, 26 firms had their mills in operation, giving employment to 5,100 persons. In October, 1880, out of the 44 mills in the State, 47 were in operation, giving employment to 10,745 persons.

"Many of the furnaces buy their ore and coal, nearly all the mills buy their iron and coal, so that the increase of the number of persons directly employed at the furnaces and mills does not show the total increase of persons employed by the revival of the iron business. Undoubtedly a great impetus has been given to the production of coal by the revival in the furnaces and mills.

"It would be difficult to trace the far-reaching effects of the change. Foundries, machine shops, railroads and other industries are all more or less benefited, and the ability of workmen to purchase and consume having been increased, there is scarcely any industry in the State that has not profited from the facts as herein set forth."

Commissioner Walls then proceeds to give

the location of each furnace, when built, size and capacity.

From a table which accompanies the report it appears that there are in the State 73 furnaces which use coal and coke and 33 charcoal furnaces; 52 of the coal and coke stacks are "in" and 21 "out;" 25 of the charcoal are in and 8 out. There are now 9796 hands employed, as against 5965 in 1879. Jackson County comes first in the number of stacks, having 18, of which number 11 are in; Lawrence County is second with 18 stacks and 14 in; Mahoning comes third with 14 stacks, of which 12 are in. The next highest on the list is Perry County with 7 stacks, and so down to 1.

The relative production of coal and coke iron and charcoal iron in Ohio for the years named is as follows:

Years.	Coal or coke.	Per cent.	Charcoal.	Per cent.
1874.....	339,166	75.1	97,835	21.9
1875.....	353,929	85.1	61,071	14.9
1876.....	353,929	87.8	48,015	12.2
1877.....	353,929	89.4	42,117	10.6
1878.....	387,478	92.0	31,513	8.0
1879.....	404,306	93.0	43,445	10.0

Of the 1,433,978 tons of coal or coke (bituminous) made in the United States, Ohio produced 404,306 tons, or 28 per cent. of the whole, and of the 353,873 tons of charcoal iron made, Ohio produced 43,445 tons, or 12 per cent. of the whole.

A summary of the number and wages of miners of ore and coal at blast furnaces is given in this table:

Employees.	No.	Av. weekly wages.	
		1880.	1879.
Ore miners.....	3,027	\$8.00	\$6.82
Coal miners, men.....	2,116	12.23	10.13
Coal miners, boys.....	123	6.38	94.88
Other mine employees.....	534	8.53
Total.....	4,811	\$9.10	\$8.00

Fifty-three of the above were employed by rolling mills, leaving 4,748 employed by the furnaces making returns, which, added to the 2114 employed at the furnaces, makes a total of 7662 persons directly employed in the working of 56 furnaces.

Fifty six of the furnaces in blast made returns to the bureau, showing the following employees and average wages:

Employees.	No.	Av. weekly wages.	
		1880.	1879.
Keepers.....	164	\$11.38	\$9.72
Filers.....	370	10.25	9.58
Mechanics.....	239	12.34	11.10
Laborers.....	1,394	8.07	7.94
Other employees.....	647	9.28	
Total.....	2,614	\$9.21	\$8.34

Mr. Walls says: Forty-seven firms in the State own or operate 54 rolling mills, located in the following counties: Belmont, 3; Columbiana, 2; Cuyahoga, 10; Erie, 1; Franklin, 2; Hamilton, 5; Jefferson, 3; Lawrence, 3; Mahoning, 8; Muskingum, 1; Meigs, 1; Scioto, 1; Stark, 2; Summit, 1; Trumbull, 7; Tuscarawas, 1 and Washington 1.

The oldest mill in the State was erected at Portsmouth in 1832. In 1851 there were seven mills. In 1852 four were erected. In 1862 there were 15 mills; in 1872 38 mills, and in 1880 54 mills. Four mills built in 1867, 1868, 1870 and 1874, and located in Ashtabula, Columbiana, Licking and Stark counties, respectively, have been dismantled.

The mills intact contain the following number of furnaces and machinery: Puddling furnaces, 682; scrap furnaces, 11; heating furnaces, 268; trains of rolls, 178; nail machines, 420; steam hammers, 29; squeezers, 3; and spike machines, 8. The capacity of the mills is about 675,000 tons of manufactured iron and steel annually. Seventeen of the mills make rails, only one making steel rails.

The steel works are classified as follows: Making Bessemer steel, 1; crucible steel, 2; open hearth steel, 5; puddled steel, 1; rolling steel, 3.

The following table gives the location of the mills; I, the number of mills, II, number in operation, and III, the number of employees:

Counties.	I	II	III
Belmont.....	3	3	960
Columbiana.....	2	2	252
Cuyahoga.....	10	10	1,945
Erie.....	1	1	194
Franklin.....	2	2	550
Hamilton.....	5	5	470
Jefferson.....	3	3	1,104
Lawrence.....	3	3	2,863
Mahoning.....	8	8	3,106
Muskingum.....	1	1	316
Meigs.....	1	1	185
Scioto.....	1	1	295
Stark.....	2	2	235
Summit.....	2	2	220
Trumbull.....	7	7	1,160
Tuscarawas.....	1	1	100
Washington.....	1	1
Totals.....	54	47	10,746

In October, 1878, 25 mills were in operation, employing 5400 persons; in 1879, 34 mills, employing 7784 persons; in 1880, 47 mills, employing 10,746 persons.

One mill in operation in 1879 was cold in 1880, and mills not in operation in 1879 started in the following counties: Columbiana, 1; Cuyahoga, 2; Erie, 1; Hamilton, 2; Lawrence, 1; Mahoning, 1; Meigs, 1; Stark, 1; Trumbull, 1; Tuscarawas, 1.

A new steel works is being erected in Columbiana county.

Following is the average weekly wages paid employees in 1880 as compared with 1879:

Employees.	1880.	1879.
Foremen.....	\$23.06
Heaters.....	20.48	\$27.60
Puddlers.....	20.98	20.00
Holders.....	13.75	34.83
Catchers.....	13.59
Other mechanics.....	15.33	13.05
Helpers.....	10.95	10.10
Laborers.....	7.50	7.47
Sailors.....	34.08	34.08
Nail feeders.....	11.00	23.40
Boys.....	4.17	5.90
Other employees.....	9.80

The report gives a number of tables of comparative production of the mills for several years. The following is a summary of the whole:

Years.	Iron.	Steel.
1874.....	203,097	27,223
1875.....	203,097	27,074
1876.....	203,097	40,150
1877.....	203,097	36,139
1878.....	203,097	53,340
1879.....	203,097	66,480

The total iron and steel manufactured in 1879 was 305,405 tons, classified as follows:

<p>Iron. NEW YORK.</p> <p>OGDEN & WALLACE, Successors to G. M. G. SMITH & CO., IRON & STEEL, 85, 87, 89 & 91 ELM ST., N. Y. COMMON AND REFINED BAR IRON. SHEET AND PLATE IRON, HOOP, BAND AND SCROLL IRON, Rod and Horse Shoe Iron, Angle and T Iron, Swedes and Norway Iron, Norway Nail Rods. Iron of all sizes and shapes made to order.</p> <p>PIERSON & CO., Established 1790, 24 & 26 Broadway, 77 & 79 New St. NEW YORK CITY,</p> <p>Ulster Iron. All Sizes and Shapes kept in Stock. ABEEL BROTHERS, (Established 1764 by ABEEL & BYVANCE, Iron Merchants, 190 South Street and 365 Water, N. Y. ULSTER IRON A full assortment of all sizes constantly on hand. Refined Iron, Horse-Shoe Iron, Common Iron, Band, Hoop and Scroll Iron, Sheet Iron, Norway Nail Rods, Norway Shapes, Cast, Spring and Tire Steel, etc.</p>	<p>Iron. NEW YORK.</p> <p>A. B. Warner & Son, IRON MERCHANTS, 28 & 29 West and 52 Washington Sts. BOILER PLATE, Boiler Tubes, Angle, Tee & Girder Iron, Boiler and Tank Rivets. Sole Agents for the celebrated "Eureka," Pennocks, "Wawasset," Lukens, Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.</p> <p>ROME MERCHANT IRON MILLS, ROME, N. Y., Manufacturers of the best grade of Bar Iron, Bands and Fine Hoops. Scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and Horse Shoe Iron. Also from Charcoal Pig a superior quality of iron branded J. O. All puddled balls re- duced by hammer. Orders may be sent to the Mill or to J. O. CARPENTER, our Agent, at 59 John Street, New York.</p> <p>MARSHALL LEFFERTS & CO., 90 Beekman St., New York City, MANUFACTURER AND DEALER. Galvanized Sheet Iron, 1st and 2d Qualities. Galvanized Wire, Telegraph and Fence; Galvanized Hoop and Band Iron, Galvanized Rod and Bar Iron, Galvanized Nails, Galvanized Chain, Galvanized Iron Pipe. CORRUGATED SHEET IRON For Roofing, &c., Galvanized, Plain or Painted. Best Charcoal, Best Refined and Common SHEET IRON. Plate and Tank Iron, C No. 1, C H No. 1, C H No. 1 Flange, Best Flange, Best Flange Fire Box, Circles. BOILER IRON Stamped and Guaranteed. All descriptions of Iron Work Galvanized or Tinned to order. Price list and quotations sent upon application.</p>	<p>Iron. NEW YORK.</p> <p>John W. Quincy, 98 William Street, New York. Anthracite & Charcoal Pig Irons, Wrought Scrap, Cut Nails, Copper, BLOCK TIN, LEAD, SELLER, ANTIMONY, NICKEL, &c.</p> <p>HARRISON & GILLOON IRON AND METAL DEALERS, 558, 560, 562 WATER ST., and 502, 504, 506 CHERRY ST., NEW YORK, have on hand, and offer for sale, the following: Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron; also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.</p> <p>OXFORD IRON CO., (B. G. CLARKE, Receiver.) Cut Nails AND SPIKES. J. S. SCRANTON, Sales Agent, 81, 83 and 85 Washington Street, NEW YORK.</p> <p>BURDEN'S HORSE SHOES. "Burden Best" Iron Boiler Rivets. Burden Iron Works, H. Burden & Sons, Troy, N. Y.</p>	<p>Iron. PITTSBURGH.</p> <p>W. D. WOOD & CO.'S  PATENT Planished Sheet Iron. Patented March 14th, 1866; April 8th, 1878; Sept. 9th, 1873; Oct. 8th, 1874; Jan. 11, 1876. Guaranteed fully equal in all respects to the IMPORTED RUSSIA IRON, and at a much less price. FOR SALE, by all the principal METAL DEALERS In the Large cities throughout THE UNITED STATES. And at their Office, 111 Water Street, PITTSBURGH, PA. John I. Williams, Henry M. Long, Nathan M. McDowell.</p> <p>Keystone Rolling Mill, Williams, Long & McDowell, Manufacturers of Merchant Bar and Skelp Iron, Sheets and Plates of all sizes, Office, No. 87 Water Street, Pittsburgh, Pa. Mill at Somo, Second Avenue. KEYSTONE ROLLING MILL. WILLIAMS, LONG & McDOWELL, Manufacturers of IRON, Pittsburgh, - - - Pa. CHAS. G. LUNDELL, No. 7 Exchange Place, BOSTON, Mass. SWEDISH IRON REPRESENTING Ekman & Co. GOTHENBURG, SWEDEN. Agency of N. M. HÖGLUND'S SONS & CO., Stockholm. Swedish & Norway Iron of every description. Stock on hand at Boston, New York and Philadelphia. Importation orders a specialty. GUSTAF LUNDBERG, 38 Kilby St., Boston. ALBERT POTTS, Philadelphia Agent, 234 & 236 N. Front Street.</p>	<p>Iron. PITTSBURGH.</p> <p>A. G. HATRY, Commission Merchant. Bar, Sheet, Tank, Boiler, Angle, T, and Railroad Iron, And Railroad Equipment. Nails & Spikes Steel & R. R. Supplies, WINDOW GLASS, GAS PIPE & BORAX. PITTSBURGH, PA.</p> <p> STEEL TOE CALKS. Extra Quality Homogeneous Steel BOILER PLATE STEEL PLATES, all descriptions. Cut Nails and Spikes, Plate and Sheet Iron, all descriptions. SHOENBERGER & CO., Pittsburgh, Pa.</p> <p>C. KANE, OLD RAILS, SCRAP IRON, STEEL, PIC IRON, BLOOMS, AND ORE. PITTSBURGH, PA.</p> <p>Portsmouth Iron and Steel Co., Successors to GAYLORD ROLLING MILL CO., Manufacturers of Siemens-Martin (Open Hearth) STEEL BOILER PLATE, Agricultural and Machinery Steel and Steel Tire. Also, Homogeneous Iron Boiler Plate and Rivets, Merchant Bar, Hoop and Sheet Iron, Wrought Spikes, Fish Bars and Bolts. Office and Works: PORTSMOUTH, OHIO. J. C. LEWIS, Pres't and Gen'l Sup't. GEO. S. LEWIS, Sec'y and Treas.</p> <p>Bonnell, Botsford & Co., Iron, Nails & Spikes. YOUNGSTOWN, OHIO. MOSES GOLDSMITH & SON, Key Box 150, CHARLESTON, S. C. Wholesale dealers in METALS, IRON, RAGS, And all kinds of Paper Stock. We invite correspondence.</p>
<p>A. R. Whitney, Manufacturer of and Dealer in IRON, 56, 58 & 60 Hudson, 48, 50 & 52 Thomas, and 12, 14 & 16 Worth Sts., NEW YORK. Our specialty is in Manufacturing Iron Used in the Con- struction of Fire-Proof Buildings, Bridges, &c. Plans and estimates furnished, and contracts made for erecting Iron Structures of every description. Books containing cuts of all iron made sent on ap- plication by mail. Sample pieces at office. Please address 58 Hudson Street.</p> <p>BORDEN & LOVELL, Commission Merchants 70 & 71 West St., New York. Agents for the sale of Fall River Iron Co.'s Nails, Bands, Hoops & Rods. AND Borden Mining Company's Cumberland Coals. WILLIAM H. WALLACE & CO., IRON MERCHANTS Cor. Albany & Washington Sts., NEW YORK CITY. M. H. WALLACE, WM. BISHAM.</p>	<p>W. BAILEY LANG, Sole Agent in United States & Canada for LOW-MOOR IRON COMPANY, NO. 50 BEEKMAN ST., NEW YORK. JAMES WILLIAMSON & CO., SCOTCH AND AMERICAN PIG IRON, No. 69 Wall St., New York. ULSTER IRON WORKS, 18 Wall St., New York. Tuckerman, Mulligan & Co Passaic Rolling Mill Co., PATERSON, N. J. Iron Bridge Builders And Manufacturers of Beams, Channels, Angles, TEES, Merchant Iron, &c., &c. New York Office, Room 45, Astor House. WATTS COOKE, President. W. O. FAYREWEATHER, Treasurer. CARMICHAEL, EMMENS & WORTH, 130, 132 & 134 Cedar St., New York. DEALERS IN IRON AND STEEL BOILER PLATE. Lap-Welded Boiler Tubes, &c., &c. Agent for Otis' celebrated Cast Steel Boiler Plates. The Cookeville Iron Co., Pittsboro Iron Co., The Laurel Rolling Mills, and Union Tube Works; Wrought Iron Beams, Angles, Tees, Rivets, &c.</p>	<p>ULSTER AND BURDEN'S H. B. & S. Bar Iron. Also Best Grades of American & English Refined Iron. All sizes and shapes in stock. EGLESTON BROS. & CO., 166 South St., NEW YORK CITY. 267 Front St., NEW YORK CITY. DAN'L W. RICHARDS. MORTON B. SMITH. DAN'L W. RICHARDS & CO., Pig Iron and Bar Iron, Scrap Iron, Scrap Steel, Old Rails and Old Metals, 88 to 96 Mangin St., New York. W. S. MIDDLETON, Broker in Machinery & Iron Agent for FORSTER'S CRUSHER & PULVERIZER, The best in market. W. S. MIDDLETON, 52 John St., N. Y. Glengarnock and Carnbroe SCOTCH PIG IRON. For spot delivery and for prompt or forward shipments to New York, Boston, Philadelphia, Baltimore or New Orleans. For sale in lots to suit by JAMES LEE & CO., Sole Agents for the United States, 72 Pine Street, New York.</p>	<p>SABLE IRON & NAIL WORKS Established 1838. Manufacturers of Merchant Iron, Universal Mill Iron and Nails of Superior Quality and Finish. Orders for odd sizes Iron filled promptly. ZUG & CO., Corner 13th and Etna Streets, PITTSBURGH, PA. LEECHBURG IRON WORKS. KIRKPATRICK & CO., Manufacturers of all grades of FINE SHEET IRONS, (Refined, Cold Rolled, Show Card, Stampings, Tea Tray, Polished, Shovel, Ferrule Iron, &c.) NATURAL GAS USED AS FUEL. OFFICE, No. 143 First Ave., Pittsburgh, Pa. WORKS, Leechburg, Pa.</p>	<p>ANDREW KLOMAN, PITTSBURGH, PA., MANUFACTURER OF Steel and Iron Structural Material  EYE BAR BLANK AS IT LEAVES THE ROLLS.  EYE BAR FINISHED FROM THE SAME. Kloman Patent Solid Rolled Eye Bars, finished in Iron or Steel without welding or "upsetting." Universal Mill Plates of Iron or Steel. Steel Rails of all sizes and patterns. Spikes Bars. Channel Bars for Thirteen Car Trucks. SPECIALTY—Unusual shapes and sizes in Steel or Iron; Angles, Tees and other structural shapes in Iron or Steel.</p>
<p>B. F. JUDSON, Importer of and Dealer in SCOTCH AND AMERICAN Pig Iron, Wrought & Cast Scrap Iron, OLD METALS. 457 & 459 Water St., NEW YORK. 233 & 235 South St., NEW YORK. DANIEL F. COONEY, (Late of and Successor to Jas. H. Holdane & Co.) 88 Washington St., N. Y. BOILER PLATES and SHEET IRON, LAP WELDED BOILER PLATES, Boiler Rivets, Angle & T Iron, Cut Nails & Spikes. Agency for Pottstown Iron Co., Vindicator Iron Works, Lebanon Rolling Mills, Pine Iron Works, Laurel Iron Works, The Bergen Rolling Mills, at Jersey City.</p> <p>P. W. GALLAUDET, Banker and Note Broker, No 3 and 5 Wall Street, NEW YORK. HARDWARE, METAL, IRON RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED. ADVANCES MADE ON BUSINESS PAPER AND OTHER SECURITIES. BATES & DESPARD, 117 Pearl St., New York, P. O. Box 764, Importers of STEEL AND IRON RAILS, SWEDISH BARS, STEEL AND PIG IRON. SCRAP IRON and OLD RAILS c. f. and l. to export, of L. & D. English ports.</p>	<p>CUT NAILS Hot Pressed Nuts, Bolts, Washers, &c. FULLER BROTHERS & CO., 139 Greenwich Street, New York.</p>	<p>CUT NAILS Hot Pressed Nuts, Bolts, Washers, &c. FULLER BROTHERS & CO., 139 Greenwich Street, New York.</p>	<p>ANDREW KLOMAN, PITTSBURGH, PA., MANUFACTURER OF Steel and Iron Structural Material  EYE BAR BLANK AS IT LEAVES THE ROLLS.  EYE BAR FINISHED FROM THE SAME. Kloman Patent Solid Rolled Eye Bars, finished in Iron or Steel without welding or "upsetting." Universal Mill Plates of Iron or Steel. Steel Rails of all sizes and patterns. Spikes Bars. Channel Bars for Thirteen Car Trucks. SPECIALTY—Unusual shapes and sizes in Steel or Iron; Angles, Tees and other structural shapes in Iron or Steel.</p>	<p>GERMAN AMERICAN PLUMB STOVE J. W. Analysed fitted with a Urea, Slags, Price lists on</p>

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We wish to call particular attention to our D. B. G. special
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Fine Light and Medium-Weight GRAY
IRON CASTINGS to order.
Correspondence solicited.

	Tons.	Plates and sheets	Tons.
Iron rails	42,905	Cut nails and	24,385
Steel rails	64,480	spikes	19,711
Bar & angle iron	130,268		

Ohio is the third State on the list of nail-makers, making 16 per cent. of the total product of the United States. Nails are made in 12 States.

An interesting table is also given of the card prices of bar iron and nails during a series of years, from which it appears that the card rates are fixed by the Western Iron and Nail Association. August 16, 1879, bar iron was quoted at 2 2-10 cents per pound, September 1, at 2 5-10 cents; September 29, 3 cents; January 5, 1880, 3½ cents; February 2, 4 cents; April 12, 3 3-10 cents; and on May 10, at 12½ cents. Nails followed in the same general direction, advancing from \$2 per keg in September, 1879, to \$5.25 in February, 1880, and falling to \$3 in July, 1880.

The wages of iron workers, who worked by the ton, fluctuated with the price of bar iron. From \$5 per ton for puddling, the price advanced to \$7.25 per ton in February, 1880, and in December, 1880, the price was \$5.50 per ton. Other millmen working by the ton experienced the same changes in wages during the year.

Mexico and its Resources.

Mexico, to-day, is attracting more attention and interest among railroad and mining men than any other part of our continent. The splendid mineral and agricultural resources of that country are generally known, but without either railway transportation or a settled government, and with a comparatively undeveloped territory, during past years it has attracted little or no American capital. Now, however, that railroads have traversed the agricultural and mining regions of the West; that the Southern Pacific through New Mexico, Arizona and California, passing near the borders of Chihuahua and Sonora, will be open for through traffic by January 1st, 1881, and now that the long and peaceable presidency of Diaz has been practically extended under his friend and advisor, Gonzales, Mexico is fast coming to be regarded with just favor by capitalists.

Lands, mines and mining real estate are not taxed in Mexico, the only impost being a mint tax on bullion. Mining laws there are more liberal than in the United States. Mining and agricultural machinery are introduced free of duty. The anxiety of the better class of Mexicans to have Americans invest capital in mining and other industrial enterprises, and the almost absolute control which the intelligent few exercise over the masses of the population, guarantee a protection to such investments equal to that afforded in the Western Territories of the United States. The climate in the mining regions of Mexico is favorable to outdoor operations during the entire year. The rains commonly begin the latter part of June, and continuing until the middle of September, reoccur through January and February. This insures a luxuriant growth of nature grasses and favors agricultural and pastoral pursuits.

The richest mining districts are those near the northern borders of the republic, where an abundant supply of timber for mining purposes is found near the bases of the detached mountains, in which the metalliferous veins are found. The States of Sonora, Sinaloa and Chihuahua, are in this respect more favored than Arizona. It is a fact, perhaps, not generally known, that extensive and valuable deposits of coal exist in Northern Mexico, which the projected railway system will soon render available. One of the difficulties encountered in Northern Mexico, however, notwithstanding its semi-annual rains, is a scarcity of running streams, though in some sections water is found in great abundance. In acquiring mining or agricultural property there, it is important to secure a supply of water to insure success. Skilled American labor costs there no more than in the neighboring territories of New Mexico and Arizona, while the native laborers, who are excellent miners, can be hired at from \$15 to \$30 per month. The valleys of Northern Mexico are narrow, but when irrigated are exceedingly fertile. They produce the cereals and fruits of the temperate zone, as well as sugar cane, tobacco and semi-tropical fruits, in great abundance and perfection.

The Guaymas and El Paso Railway, now being built from Guaymas, on the Gulf of California, via Hermosillo to El Paso, through the Sonora River Valley, will, upon its early connection with the Atchison, Topeka and Santa Fe Railroad, open a ready and increasing market for the peculiar products of that region. When American machinery, capital and mining methods are employed in that country, and when the railroads now building are completed, an enormous increase must take place in mineral and agricultural production and values. Independent of this the influx of American capital and population, now setting in that direction, will secure an immediate advancement of values there.—New York Mining Record.

One of the most interesting objects offered to public inspection at the Sydney International Exhibition was a dwelling house exclusively made of paper, and furnished throughout with articles manufactured from the same material. Walls, roof, floorings and staircases alike consisted of cartonnage; the carpets and curtains, bedsteads, lamps, sheets and counterpanes, towels, bootjacks, baths, kitchen utensils, &c., were one and all preparations of papier-mache, as were the very stoves used for heating the rooms, in which large fires were kept burning daily throughout the duration of the exhibition. Several banquets were given in the paper house by its owners to the commissioners, members of the press and foreigners of distinction. All the plates and dishes, knives and forks, bottles and drinking vessels used at these entertainments were fabricated entirely and solely of paper. Should these paper buildings come into vogue they may be expected to superinduce some striking changes in the rates of fire insurance, at present calculated upon a basis of bricks and mortar.

Iron.
NEW YORK.
OGDEN & WALLACE,
Successors to GAM'L G. SMITH & CO.,
IRON & STEEL,
85, 87, 89 & 91 ELM ST., N. Y.
**COMMON AND REFINED
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SHEET AND PLATE IRON,
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Iron of all sizes and shapes made to order.

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Solid Steel Calk Horse and Mule Shoes.
These shoes are made of superior iron, completely finished
and ready for cold shoeing; have clip and solid steel calk. The
holes are punched through at the proper angles and free from
burrs. Same number of shoes per keg as in kegs of unfinished
shoes.
We wish to call particular attention to our D. B. G. special
Crane Chain, made of an extra brand of reworked iron, uniting
great tensile strength and wear, fully tested and war-
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of English Crown chain, and specially adapted for rafting,
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LOCOMOTIVE AND CAR WHEEL TIRES,
Manufactured from the celebrated OTIS STEEL.
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NORTH BROS.,
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Fine Light and Medium-Weight GRAY
IRON CASTINGS to order.
Correspondence solicited.

Tons.	Plates and sheets.	Tons.
Iron rails..... 42,965	Cut nails and	24,389
Steel rails..... 65,480	spikes..... 39,717	
Bar & angle iron..... 130,268		

Ohio is the third State on the list of nail-makers, making 16 per cent. of the total product of the United States. Nails are made in 12 States.

An interesting table is also given of the card prices of bar iron and nails during a series of years, from which it appears that the card rates are fixed by the Western Iron and Nail Association. August 16, 1879, bar iron was quoted at 2 2-10 cents per pound; September 1, at 2 5-10 cents; September 29, 3 cents; January 5, 1880, 3 1/2 cents; February 2, 4 cents; April 12, 3 3-10 cents; and on May 10, at 12 1/2 cents. Nails followed in the same general direction, advancing from \$2 per keg in September, 1879, to \$5.25 in February, 1880, and falling to \$3 in July, 1880.

The wages of iron workers, who worked by the ton, fluctuated with the price of bar iron. From \$5 per ton for puddling, the price advanced to \$7.25 per ton in February, 1880, and in December, 1880, the price was \$5.50 per ton. Other millmen working by the ton experienced the same changes in wages during the year.

Mexico and its Resources.

Mexico, to-day, is attracting more attention and interest among railroad and mining men than any other part of our continent. The splendid mineral and agricultural resources of that country are generally known, but without either railway transportation or a settled government, and with a comparatively undeveloped territory, during past years it has attracted little or no American capital. Now, however, that railroads have traversed the agricultural and mining regions of the West; that the Southern Pacific through New Mexico, Arizona and California, passing near the borders of Chihuahua and Sonora, will be open for through traffic by January 1st, 1881, and now that the long and peaceable presidency of Diaz has been practically extended under his friend and advisor, Gonzales, Mexico is fast coming to be regarded with just favor by capitalists.

Lands, mines and mining real estate are not taxed in Mexico, the only impost being a mint tax on bullion. Mining laws there are more liberal than in the United States. Mining and agricultural machinery are introduced free of duty. The anxiety of the better class of Mexicans to have Americans invest capital in mining and other industrial enterprises, and the almost absolute control which the intelligent few exercise over the masses of the population, guarantee a protection to such investments equal to that afforded in the Western Territories of the United States. The climate in the mining regions of Mexico is favorable to outdoor operations during the entire year. The rains commonly begin the latter part of June, and continuing until the middle of September, recur through January and February. This insures a luxuriant growth of nature grasses and favors agricultural and pastoral pursuits.

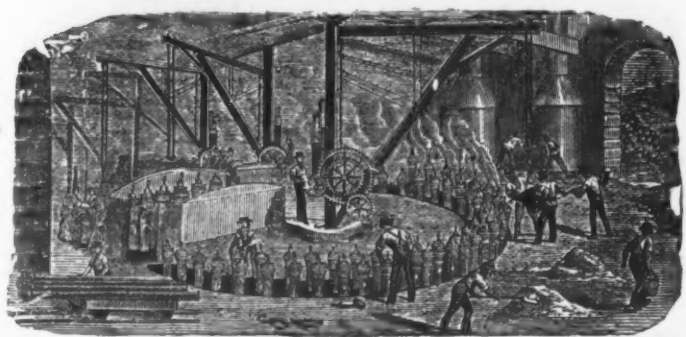
The richest mining districts are those near the northern borders of the republic, where an abundant supply of timber for mining purposes is found near the bases of the detached mountains, in which the metalliferous veins are found. The States of Sonora, Sinaloa and Chihuahua, are in this respect more favored than Arizona. It is a fact, perhaps, not generally known, that extensive and valuable deposits of coal exist in Northern Mexico, which the projected railway system will soon render available. One of the difficulties encountered in Northern Mexico, however, notwithstanding its semi-annual rains, is a scarcity of running streams, though in some sections water is found in great abundance. In acquiring mining or agricultural property there, it is important to secure a supply of water to insure success. Skilled American labor costs there no more than in the neighboring territories of New Mexico and Arizona, while the native laborers, who are excellent miners, can be hired at from \$15 to \$30 per month. The valleys of Northern Mexico are narrow, but when irrigated are exceedingly fertile. They produce the cereals and fruits of the temperate zone, as well as sugar cane, tobacco and semi-tropical fruits, in great abundance and perfection.

The Guaymas and El Paso Railway, now being built from Guaymas, on the Gulf of California, via Hermosillo to El Paso, through the Sonora River Valley, will, upon its early connection with the Atchison, Topeka and Santa Fe Railroad, open a ready and increasing market for the peculiar products of that region. When American machinery, capital and mining methods are employed in that country, and when the railroads now building are completed, an enormous increase must take place in mineral and agricultural production and values. Independent of this the influx of American capital and population, now setting in that direction, will secure an immediate advancement of values there.—New York Mining Record.

One of the most interesting objects offered to public inspection at the Sydney International Exhibition was a dwelling house exclusively made of paper, and furnished throughout with articles manufactured from the same material. Walls, roof, floorings and staircases alike consisted of cartonnage; the carpets and curtains, bedsteads, lamps, sheets and counterpanes, towels, bootjacks, baths, kitchen utensils, &c., were one and all preparations of paper-maché, as were the very stoves used for heating the rooms, in which large fires were kept burning daily throughout the duration of the exhibition. Several banquets were given in the paper house by its owners to the commissioners, members of the press and foreigners of distinction. All the plates and dishes, knives and forks, bottles and drinking vessels used at these entertainments were fabricated entirely and solely of paper. Should these paper buildings come into vogue they may be expected to superinduce some striking changes in the rates of fire insurance, at present calculated upon a basis of bricks and mortar.

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CAST IRON PIPES FOR WATER AND GAS.

ESTABLISHED IN 1848.

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MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

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For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

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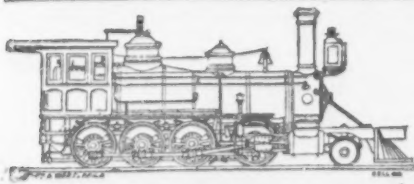
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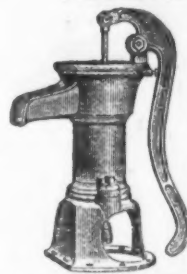
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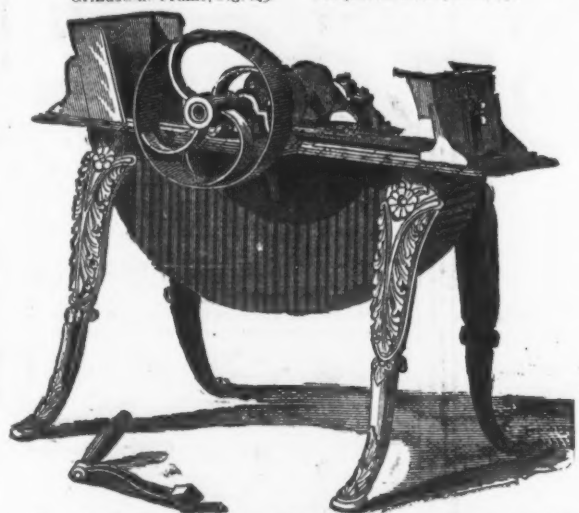
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The Genesis of Iron Ores.

Prof. T. Sterry Hunt, in a paper read before the Association for the Advancement of Science, has, in an admirable way, summed up the present status of our knowledge of the chemical reactions which have led to the formation of iron ore deposits:

Iron is generally present in mineral silicates in the crystalline rocks in a ferrous condition, and liberated therefrom by the sub-aerial decay of these as hydrous ferric oxide. This is by the agency of organic matter again reduced to ferrous oxide, which is dissolved in natural water by carbonic acid or some organic acid, from which solutions it may be deposited either as hydrous peroxide (limonite, &c.) as carbonate (siderite), as silicate or as sulphide (pyrite, &c.), in all of which forms iron is found in sedimentary deposits. As regards the formation of siderite, he describes experiments which show that solutions holding five grams of ferrous carbonate dissolved as dicarbonate in a liter of water, are spontaneously decomposed in close vessels at the ordinary temperature, and deposit two-thirds of their iron as a white crystalline (hydrated) mono-carbonate, with liberation of carbonic acid. This serves to render more intelligible the reduction and segregation of iron as siderite in earthy sediments, as long since pointed out by W. B. Rogers, for the ores of the coal measures. The intervention of soluble sulphates and their reduction through organic agency to sulphides, determines the formation of sulphide of iron in sediments. The generation of a bisulphide (pyrite or marcasite) was then discussed, and it was shown that the ferrous monosulphide which naturally is first generated, may fix a further portion of sulphur and thus form a more stable compound. One example of this is seen when recently precipitated hydrous ferrous sulphide is brought in contact with a solution of a ferric salt, which takes up a portion of the iron, leaving sulphur free to unite with the undecomposed sulphide, and form therewith a very stable higher sulphide of iron. Experiments now in progress lead to the belief that sulphur liberated from soluble sulphides may, in a similar manner, unite with ferrous sulphide, and thus help us to explain the generation of pyrites in nature, in the presence of water, at ordinary temperatures. The changes of siderite and pyrite under atmospheric influences were next considered. The latter by oxidation yields, as is well known, ferrous sulphate. Its frequent conversion by sub-aerial decay into limonite was conceived to be due to the intervention of water-holding carbonates, which, conjointly with oxygen, change it into hydrous peroxide (limonite), which often retains the form of the pyrites. The transformation of carbonate of iron into hydrous peroxide is a familiar fact. Limonite ores may thus be produced in three ways. They are sometimes formed by the peroxidation and precipitation of dissolved ferrous salts, as in the so-called bog ores; but more frequently from the alteration *in situ* of deposit of pyrite or of siderite.

Internal Taxation in Great Britain.

If any one believes that a consumer in Great Britain derives any advantage in the long run from the fact that only a few imports are taxed, he has only to examine the statistics of home taxation, showing the sources whence the government derives the revenue not raised by imports.

A Parliamentary return just published in England gives the particulars in detail of all taxes and imposts from which the imperial revenue of the United Kingdom is raised, together with the gross amount yielded by such tax or impost, and the cost or charge for collecting the same under each head. The three main sources of imperial revenue in the United Kingdom are the inland revenue, customs and post office. For the financial year ending the 31st March last, the inland revenue yielded £46,452,454, the customs £18,105,530, and the post office £3,053,134, or a grand total of £67,611,118. These were the results obtained after deducting the costs of collection, which amounted in the case of the inland revenue to £1,016,406, the customs to £1,005,556, and in the case of the post office to £5,220,794. The receipts from inland revenue are divided under three chief heads—excise, stamps and taxes. The excise last year yielded a net revenue of £25,213,303; stamps, £11,306,014, and taxes £11,843,613. The amount of revenue derived directly and indirectly from the consumption of excisable liquors and the drinking customs of the country is remarkably large. The spirit duty, for example, yielded last year no less than £14,118,677, 9/9, and the malt duty £6,945,023, 1/5. These two items together make an aggregate of over £21,000,000; and if we add to this the receipts from customs duties upon foreign liquors consumed in this country, which in the case of spirits amount to £4,686,806, of wine £1,394,062, and of malt and its products £529,474, we get a grand total of over £27,149,862 paid in the shape of duties upon liquors consumed in the country. But this is far from exhausting the amount of revenue obtained indirectly from this source. In the United Kingdom, for example, there are 21,346 brewers who paid £405,021, 15/ in the shape of license duty, and there were 3835 malsters who paid over £13,305. Then in England and Ireland there were 85,605 spirit retailers who paid £614,937, of license duty, and in Scotland 11,626 who paid £106,468. This is in addition to the various license duties paid for the sale of beer and wine by wholesale and retail dealers, as also the receipts from grocers' licenses. The amount received under these various heads was not less than £1,454,569. So that the total revenue received in the shape of duties on liquor and licenses for the manufacture and sale of it amounted to over £28,604,381. If to this sum be added the amount received in the shape of customs duties on tobacco, £8,630,567, it brings up the revenue received on account of those two luxuries to the enormous sum of £37,234,948, being considerably more than one-half of the total net revenue of the United Kingdom obtained from taxation. Next in importance to the inland revenue and customs duties come the direct taxes levied on

the country. These consist of the land tax, the inhabited house duty and income tax. The total receipts last year from these three sources amounted to £12,024,216. Of this the proportion for income tax was £9,350,522; for inhabited house duty, £1,602,650; and for land tax, £1,071,004. The income tax last year was levied at the rate of 5d. in the £, and it realized over £9,350,000. The third source of income under the head of inland revenue, is the stamp duties, including legal deeds and instruments of all kinds, probates of wills, letters of administration, and such like. The total receipts under these various heads last year amounted to £11,527,040. Probate and legacy duties realized £2,677,861, and legacy and successions on duties, £3,722,022. The aggregate net revenue for 1879-80 was nearly two millions less than during the previous year. There was a deficiency of nearly a million in the inland revenue receipts alone, and of over a million in the receipts from customs duties. The receipts from the post office, on the other hand, showed an increase of nearly £200,000.

Our Trade With China.

In the year 1879, the last for which official reports have been published, we sent to the Chinese, besides wheat flour:

Clocks, to the value of.....	\$35,397
Cottons, colored.....	279,000
Cottons, uncolored.....	1,305,000
Drugs and chemicals.....	13,760
Glassware.....	14,000
Silver bullion.....	183,000
Machinery.....	9,000
Other iron manufactures.....	9,000
Firearms.....	17,000
Lamps.....	29,000
Kerosene.....	69,000
Ordnance stores.....	9,000
Provisions—such as bacon and other meats, butter and cheese, &c.....	42,000
Refined sugar.....	7,000
Tobacco.....	52,000
Clothing.....	10,000

Total.....\$4,146,007

The sum total is not great, but the list shows how varied are the Chinese demands which our producers and manufacturers can supply, and it is curious to remark that the old time Yankee superiority in clock making makes itself felt in an export to China of \$50,000 worth of these. It is clear enough that the best interests of the United States require a friendly understanding with a people who are so numerous and so thrifty, and to whom our own people can supply so many articles in the growth or manufacture of which we excel the world.

English papers of recent date contain extracts from their Chinese consular reports just published for the last year, which show that the Americans are fast gaining entire control of the Chinese markets with their cotton goods. We called attention to this fact in 1878, but the progress of our manufacturers has been much more rapid since then. "At Chenkiang," reports the English Consul, "the import of English drills decreased between 1878 and 1879 from 63,725 pieces to 39,620, while the import of American drills increased from 9735 to 24,285 pieces." At Shanghai the American increase of importation surpassed that of the English and Dutch together by 95,159 pieces. In sheetings our progress at the same port was still more marked. In 1878 we exported 390,000 pieces; in 1879, nearly double—655,773; while the English increase was only 13,565. At Tientsin the increase in American imports of drills during that year was equal to the whole of the English importation for the same time. In sheetings, of which we exported none in 1876, we sent last year 409,442 pieces, while the English exportation was rapidly going down, having reached 36,445. And so on through all the ports of entry.

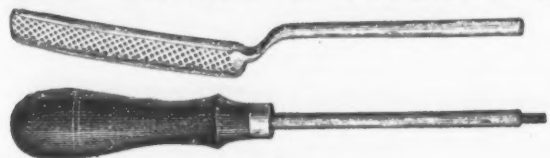
The English consuls urge the fact upon Manchester manufacturers that this decline of their goods in the market is wholly owing to their practice of adulteration, heavy sizing, &c., while the American goods are honestly made. As the English hold upon the importing trade of China depends, at the present time, upon these adulterated cotton goods on one hand, and the poisonous opium drug on the other, it is, and it deserves to be, exceedingly insecure. Nothing more than a steady adherence to an honest policy is needed on the part of Americans to gain control of that important market.

Effects of British Agricultural Depression.—The London Economist enters into a calculation to ascertain the effect the British agricultural depression had upon that country. It estimates the rent of land as £69,000,000 a year; a reduction of 20 per cent. would give £13,800,000 diminution of rent; this would entail in addition a loss on traders' profits at £69,000,000, and a drop of 5 per cent. in their profits; after rents had been readjusted a diminution of £3,500,000 would follow said drop; this would make the whole drop in farmers' and traders' profits £4,000,000; adding the losses incurred by landlords and farmers will make a total loss of £19,000,000 a year; but then a portion of this loss would be recouped by the country in the cheapening of production. Mr. Caird estimates the value of agricultural products consumed in the country at £400,000,000 a year. A reduction of 5 per cent. on this would be £20,000,000. So that the country gains on one hand exactly what it loses on the other. The Economist concludes that while there is a reduction in the value of agricultural produce, the gain to the community at large will greatly outweigh the loss to individuals. Ultimately there must be a reduction in rents, which it is thought, however, is not likely to be so large as 20 per cent.; then the enterprise of land owners will be stimulated to discover where improvements can be made; the enterprise of farmers will also be called forth; some time will be required to recover from the depression; but when events resume their natural course the Economist hopes that the lost ground will eventually be regained.

A Railroad From the Coal Fields to New England.—A corporation has been formed under the name of the Lehigh and Hudson River Railroad Company, for the perfection of a through line between the Hudson River at Newburg and the Delaware River at Belvidere, N. J. The purpose is to build 23 miles of road between Belvidere and

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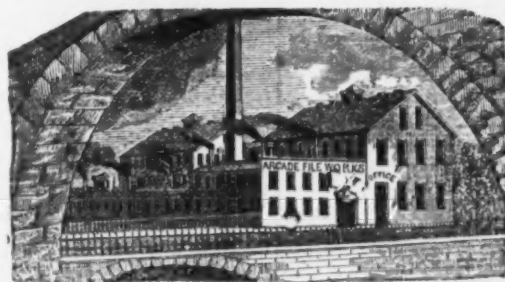
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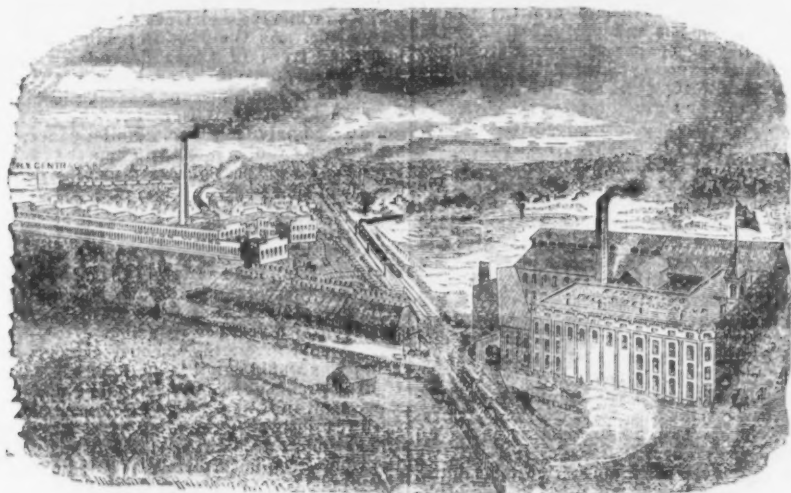
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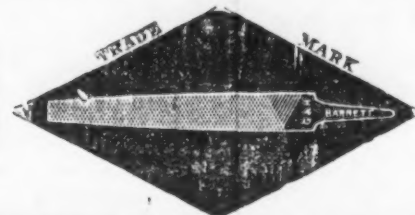
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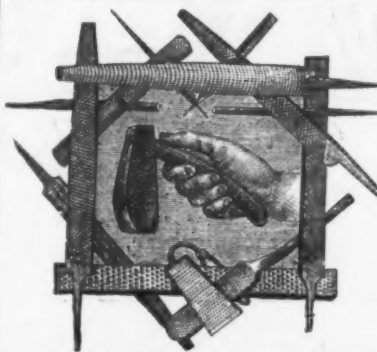
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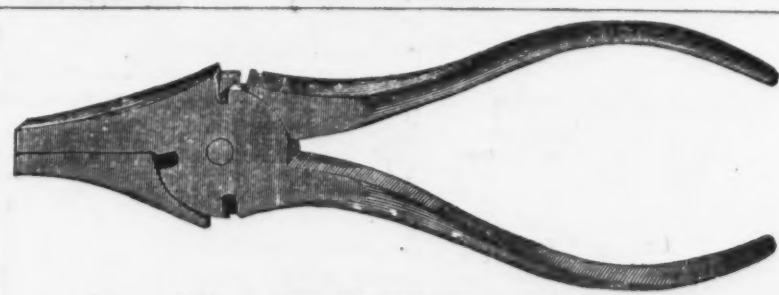
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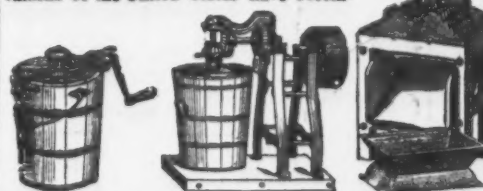
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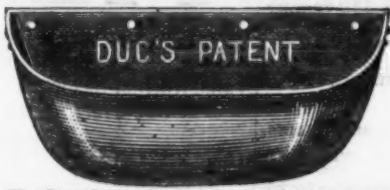
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This improvement makes the tool the best and cheapest that you can have in your shop.

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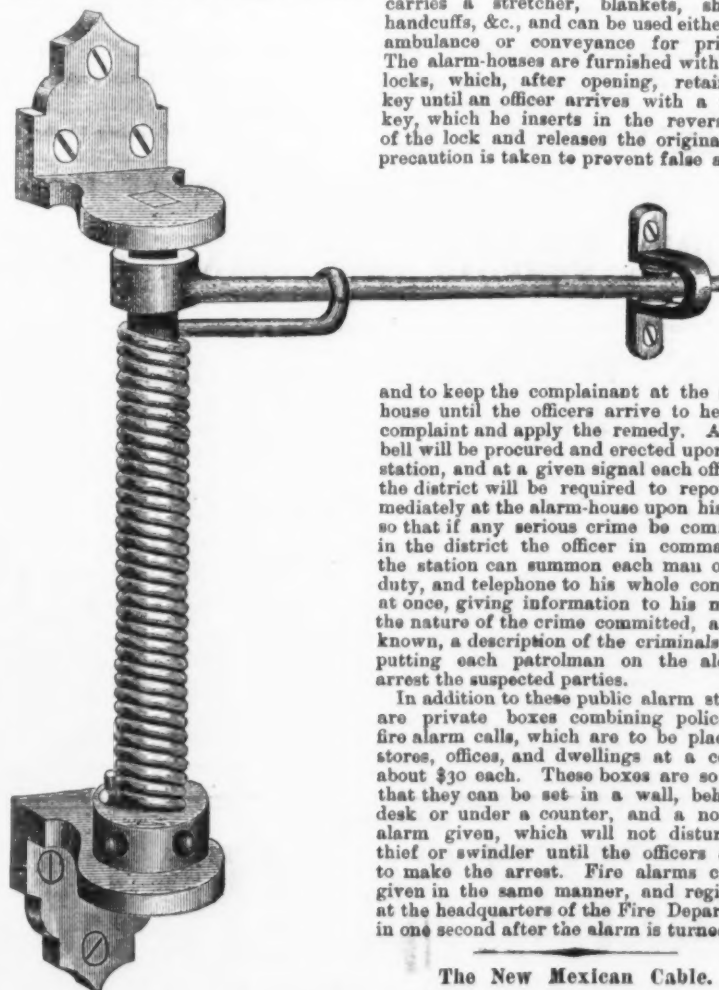
The center of rivet being only three-fourths of an inch from the cutting edge, they have nearly double the cutting power of most other kinds.

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Andover, use the Sussex Railroad, or build an independent line from there to the McAfee terminus of the Warwick Valley Railroad, and run over the latter road to its connection at Greycourt with the New York Lake Erie and Western and Newburg Branch. The plan includes the consolidation, under one management, of the whole route between Greycourt and the Delaware River. Connection at Newburg will be had with the New York and New England Railroad, now being built, and at the western end of the route with the Lehigh Valley and other roads, making the line an important one between New England and the coal fields of Pennsylvania. Much of the line is located, and a portion will be put under contract in a few weeks. The road is to be completed next Fall. The company's officers are: Grinnell Burt, president; George R. Blanchard, vice president; Alfred Ely, secretary; D. B. Halsted, treasurer. The other directors are: Thomas C. Platt, William C. Sheldon, John S. Martin, G. A. Hobart, D. F. Merritt, James A. Titman, Frederick A. Potts, B. W. Spencer, and Charles Scranton.

Engine House Door Spring.

The accompanying cut represents a heavy door spring, the special features of which are strength and durability. It is manufactured by J. B. Shannon & Sons, 1009 Market street, Philadelphia, and has been especially devised to fill a want long felt in connection with the doors of steam fire-engine



DOOR SPRING ADAPTED TO USE IN STEAM FIRE ENGINE HOUSES.—SCALE, ABOUT 1/4 FULL SIZE.

houses. To any one who has seen the rapid preparations made for getting an engine to the scene of a fire after an alarm has been sounded, it will be plain that the efficiency of the department in some measure depends upon how suddenly the doors can be opened automatically. Systems vary somewhat as between different cities, although in the main they agree. The original alarm moves a lever, which releases the horses and opens the stable doors. The horses rush out, and place themselves alongside the pole of the engine. At the same instant men are ready to hook the traces and attach the breast chains. By this time the driver is on his seat and the engine men in their places. All is ready for the door to open. The driver reaches above his head, pulls a ring attached to a rope that releases the front doors, which in turn swing open by the force of some such spring as we show in our engraving. It is evident that considerable power is required in a spring for this purpose, for as the doors start to open, the horses rush forward as though it was not possible for anything to be between them and the street. If the doors should fail to swing clear back, there would at once be either an engine or a door requiring considerable repairs. When it is considered that from the time that the alarm is sounded until the engine is out of the house only 8, or, at most, 10 seconds have elapsed, it will be seen how necessary great strength and efficiency of parts become. The spring here represented was originally gotten up in answer to a demand made by the Philadelphia Fire Department. There are no novel features about its construction, but the best of materials have been used in the best manner. The spring is made of steel wire specially manufactured for the purpose by the Washburn & Moen Manufacturing Company, 1/4-inch 3/8-inch and 1/2-inch being used in the different sizes. The spring is made 15 inches, 21 inches and 24 inches long. By its construction these springs are adapted to both swinging a door open and closing it. The engraving shows one adjusted for closing a door. When applied to an engine-house door, the rod would be on the other side of the small pulley.

the rails that it is deemed unsafe to run the cars, and passengers are brought into the city for two miles by hacks.

The Chicago Police Alarm System.

A system of telegraphic alarms has been recently adopted in Chicago for police signaling. Sixty days' trial of the system in the Twelfth street district has convinced the city authorities of the advantages of the system, and it is now proposed to extend it to the West Lake street district, covering an area of over four square miles. The public alarm houses, as described by the city Chief of Police, are built of wood, and just large enough to admit a man. They are placed upon the sidewalk, as near to street corners as practicable, and securely fastened either to telegraph poles or corner stores. The keys to such houses are uniform; they are furnished to respectable citizens upon application at the station, and a record is kept of the names of key holders. A mechanical alarm to register the location of the complaint is inclosed in a small box attached to the side of the house, which box also incloses a telephone for the use of the officer traveling that particular post, and which places the officer in direct communication with his commander at the station. The citizen who possesses a key can, by pulling down a lever which protrudes through a slit outside the box, procure the attendance of three policemen and a horse and wagon in from one to four minutes after entering the alarm-house. The wagon carries a stretcher, blankets, shackles, handcuffs, &c., and can be used either as an ambulance or conveyance for prisoners. The alarm-houses are furnished with patent locks, which, after opening, retains the key until an officer arrives with a master key, which he inserts in the reverse side of the lock and releases the original; this precaution is taken to prevent false alarms,

and to keep the complainant at the alarm-house until the officers arrive to hear the complaint and apply the remedy. A large bell will be procured and erected upon each station, and at a given signal each officer in the district will be required to report immediately at the alarm-house upon his post, so that if any serious crime be committed in the district the officer in command at the station can summon each man on post duty, and telephone to his whole command at once, giving information to his men of the nature of the crime committed, and, if known, a description of the criminals, thus putting each patrolman on the alert to arrest the suspected parties.

In addition to these public alarm stations are private boxes combining police and fire alarm calls, which are to be placed in stores, offices, and dwellings at a cost of about \$30 each. These boxes are so small that they can be set in a wall, behind a desk or under a counter, and a noiseless alarm given, which will not disturb the thief or swindler until the officers arrive to make the arrest. Fire alarms can be given in the same manner, and registered at the headquarters of the Fire Department in one second after the alarm is turned on.

The New Mexican Cable.

Mexico, and, in consequence, the Brazilian Empire, Chili and Peru, are about to be brought into close telegraphic connection with New York. This will be accomplished through the speedy opening of a line established by the Mexican Telegraph Company, recently organized under the laws of the State of New York, and of which Mr. James A. Scrymser is president, associated with Wm. G. Hamilton and other New York capitalists. They have had constructed a cable, 505 miles in length, to extend from Brazos Santiago, to Tampico, and from thence to Vera Cruz. One of the steamers, bearing a section of the cable, the *Dacia*, has already arrived at Tampico, and her consort, the *International*, bearing the remainder, will reach there within ten days from the present date. Mr. Scrymser, of whom *The Iron Age* reporter inquired for further information, states that in one week after the cable has reached its destination the line will open for business. The cable weighs five tons to the knot, and was contracted for at \$300,000.

This enterprise was undertaken in anticipation of the vast revival and extension of commerce, which promises to regenerate the ancient republics of Mexico and Central America, through the efforts of citizens of the United States. The prospective construction of a ship canal at Panama afforded one of the chief incentives. Added to this is the railroad awakening all through the northern states of Mexico, now in course of development, to be followed by a renewed impetus to mining of every description. Arrangements have been made with the Mexican government under which there is a virtual guaranty that all the foreign business of the Mexican lines shall be concentrated upon the submarine cable for transmission abroad.

The full import of the new cable does not appear until the fact is considered that at present a message for Brazil or ports on the West Coast of South America, must go by way of Europe, from Lisbon and the Madeira Islands, to Pernambuco, and thence down the coast to the La Plata and across the Continent upon the other side. The rates are almost prohibitory, whereas by the new route the distance is reduced from 9600 miles to 3300 miles, and the charges from \$8 per word to \$3. Thus it appears that the Mexican cable will supply the link necessary to connect Mexico and South America with the United States and Europe. More than this, there is a projected route to the Pacific Ocean via the Isthmus of Tehuantepec, which will insure certain and direct connection with Australia and the East,

TWINE
BOXES,
BAG
FILLERS,
HAND
SCOOPS,
&c.

Send for Illustrated
Price List.

Manufactured by
John Chatillon & Sons,
89, 91, 93 Cliff Street, New York.

THE ANSONIA CORRUGATED STOVE PLATFORM.

With Patented O. G. Border.



ROUND ZINC.
27, 30, 32, 34, 36 inch.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discount.

Packed 12 in each case.

PURE ELECTRIC WIRE,

Manufactured by the

ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splittorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Patches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of
PEN AND POCKET CUTLERY,
 Solid Steel Scissors, Shears, Razors, &c.
 Sole proprietors of the renowned full concave
"ELECTRIC RAZORS,"
 And the celebrated **"ELECTRIC SHEARS."** Nickel Plated
 Agents for the **BENGALL RAZORS.**
AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
 91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, Mo.

MERIDEN CUTLERY COMPANY.

The "PATENT IVORY" HANDLE TABLE KNIFE.

The oldest manufacturers of Table Cutlery in America. Exclusive makers of the CELLULOID HANDLE for Table Cutlery. A most beautiful and perfect substitute for Ivory. Also makers of all kinds of TABLE, BUTCHER AND HUNTING KNIVES. Illustrated catalogues with prices sent to the trade on application. SALESROOM, No. 49 Chambers St., N. Y. Address all communications to West Meriden, Conn.

THE LAMSON & GOODNOW MFG. CO.,

Salesroom and Warehouse, 88 Chambers Street, New York City. Factories, Shelburne Falls, Mass.

Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest price in wood and iron handles.

OUR BUTCHERS' and HUNTERS' KNIVES

Are guaranteed to be equal in style, finish and quality, to any goods made in the world.
"COMPARE, THEN JUDGE."

We are the sole owners of the *Gardner Patent Guard and Rest for Carving Forks*, and the manufacture of fine carvers is with us a specialty.

AARON BURKINSHAW, Pepperell, Mass.,

Manufacturer of
PRUNING, BUDDING AND POCKET KNIVES
 OF EVERY DESCRIPTION.

My Blades are forged by hand from the best cast steel and warranted. Established 1835.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES, BUTCHERS' STEELS, AND SHOE KNIVES.

It having come to the knowledge of JOHN WILSON that Counterfeit Butchers' Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such impostors.

JOHN WILSON also hereby gives Notice, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark.

Every article of JOHN WILSON'S manufacture, bears the Trade Mark, in addition to the Name.

WORKS—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

Office of
PHOENIX CASTER CO.,
 INDIANAPOLIS, IND.

The Simmons Hardware Co., of St. Louis, Mo., bought of us Martin's Patent Caster, as follows:

1878..... \$15.00
 1879..... 410.00
 1880..... 650.00

Your trade will increase in them in the same proportion.

The Hardware trade desires an Improved Caster. We have it. Will be pleased to execute your sample order.

PHOENIX CASTER CO.,
 Manufacturers,
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Cutlery.

ALFRED H. HILDICK,

19 Warren St., N. Y.,
 Importer of CHAINS, ANVILS, VISES, &c.

Agency of
 HILL BROTHERS & CO., WALSHALL, ENGLAND
 GENERAL HARDWARE MERCHANTS,
 And of

BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

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Joseph Rodgers & Sons,

(LIMITED)
 CELEBRATED CUTLERY,
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The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

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ESTABLISHED 1836.

Alfred Field & Co.,

COMMISSION MERCHANTS,
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Guns and Pocket Cutlery.

SPECIALTIES.

Headquarters for
 ELEY'S BROS' GOODS, WRIGHT'S ANVILS,
 WILSON'S BUTCHER KNIVES, &c.

WOSTENHOLM'S POCKET CUTLERY AND RAZORS,
 FIELD, FRASER & CONTINENTAL POCKET KNIVES,
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 ROBERT SORBY & SONS' SHEARS,
 STUBBS' FILES, WESTERN FILES,
 GREAVES' SHEEP SHEARS,
 CHESTERMAN'S TAPES,
 GERMAN COIL AND HALTERS and other CHAINS,
 BRADEN'S TROWELS AND HOES,
 CANASTOTA KNIFE CO.'S POCKET KNIVES,
 Etc. Etc. Etc.

All sorts of Hardware and Merchandise for import and export purchased on commission.

ROBERT SORBY & SONS,

SHEFFIELD,
 MANUFACTURERS OF THE CELEBRATED

Kangaroo Sheep Shears.

The best Shears made.

Every Shears Guaranteed.

ALFRED FIELD & CO.,

93 Chambers St., - NEW YORK,
 SOLE AGENTS.

Send for price list and terms.

THE SLAYTON RAZOR.

PERFECTION For Portability. For Cutting Quality. For Temper.

Handles of German Silver, Nickel Plated. Blades of the Finest Steel in the World. Every Razor Fully Warranted.

L. C. TOWER, Thermometer Manuf.,

39 Exchange St., Rochester, N. Y., Sole Agent.

Canvassers wanted. Sample by mail, \$1.

J. R. TORREY RAZOR CO.,

FACTORY, WORCESTER, MASS.

For Fine Cutting Qualities, and Adaptation to all Beards, our

RAZORS

Have no equal.

Price Lists on application.

Can be obtained only from the

Boentgen & Sabin's

HALF OPENED PATENT SPRINGLESS

MARVEL POCKET KNIFE

cutlery manufacturers who wish to

buy the American-made razor

should apply at once.

FURNESS, BANNISTER & CO.,

NEWARK, N. J.

Manufacturers of

TABLE CUTLERY.

PRICES FURNISHED ON APPLICATION.

Cutlery.

French Clippers

PEUGEOT FRERES.

Barber's Clipper.

We are sole agents for these Clippers. All orders should be addressed to us to obtain lowest prices.

McCoy & Sanders,

132 Duane St., New York.

Horse Clipper.

Silver Medal, 1878—Paris.

J. R. SPENCER & SON,

Albion Steel Works, Sheffield,

MANUFACTURERS OF

FILES

AND

STEEL.

Table Knives, Razors, Shovels, &c., &c.,

of every description.

CORPORATE MARK.

SPENCER SHEFFIELD

Granted 1749.

LAMONT

PATENT

COMBI-NATION

RAZOR

STROP,

Manufactured by COPELAND, HALL & Co.

Rochester, N. Y.

Coulter, Flagler & Co., Sole New York City Agents.

TELESCOPE TUBES.

Fine Mandrel-drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEARIN & CO., 300 N. 12th St., Philadelphia, makers of the American Improved Brass Garden Syringe

CLOTHES WRINGERS.

"EUREKA" WRINGER.

BOSTON.

T. J. ALEXANDER, Manager,

BOSTON, MASS.

20,000 Sold the Second Year.

THE BEST ADJUSTABLE BAG HOLDER

In the World.

PRICE ONLY \$1.50.

Sent free, on receipt of the price, anywhere in the United States.

Just the thing for the Farmer, Thresher, Miller, the Feed Store, Grain, Potato, Guano and Phosphate dealers, Postmasters and Publishers, and to all others who use Sacks or Bags.

It is indispensable. A perfect and simple device, made of iron, and will last a life time.

Sold by the Hardware trade everywhere. Orders solicited. The plat form is extra if wanted. Agents wanted everywhere. Address

L. JEFF. SPRENGLE,

Sole Manufacturer,

Ashland, Ohio.

None can do without it for \$1.50.

Send for a circular.

Special discount to the trade.

FORGED OX SHOES.

The only Ox Shoe made with patent concavity to fit hoof.

Also Flat Shoes with two calks complete, at same price.

Worth double any Malleable Iron Shoe.

Greenfield Tool Co.,

Greenfield, Mass.

A. G. COES
 PAT. DEC. 26, 1874

Established in 1839.

A. G. COES & CO.

WORCESTER,

MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw

Wrenches.

PATENTED,

May 2, 1871.

December 26, 1871.

December 28, 1875.

August 1, 1876.

The backstrain when the wrench is used is borne by the bar—not by the handle.

The strongest Wrench made, and the only successful Re-enforced Bar.

None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

STANDARD

GIRARD WRENCH.

WARRANTED.

FOR

STRENGTH

AND

Durability

IT HAS

NO SUPERIOR.

GUARANTEED

IN

EVERY RESPECT.

Wrought Bar, Head and Screw.

Owing to the increased demand for these justly

Popular Wrenches,

we are now manufacturing more than any other establishment in the world.

Our Wrench having been imitated by other manufacturers, we have adopted the above Trade Mark, and will hereafter stamp all our goods.

SEND FOR

TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

"DRAW CUT"

BUTCHERS' MACHINES.

Choppers, Hand and Power

Stuffers,

Lard Presses,

Warranted thoroughly made and the Best in Use.

MURRAY IRON WORKS,

Hartington, Iowa.

GEO. M. EDDY & CO.,

Manufacturers of

Measuring Tapes

Of Cotton, Linen & Steel.

FOR ALL PURPOSES.

351 to 353 Classon Ave., Brooklyn, N. Y.

CHAS. E. LITTLE,

59 Fulton St., New York,

Pump-Log and Tubing Augers

and Fittings,

And Agent for

Barnes' Wood-Working Machinery

and Lathes.

Clements' Steam Band Saw.

Kimball's Foot-Power Band Saw.

THE WM. ROGERS MFG. CO.

Superior Silver-Plated Table Ware.



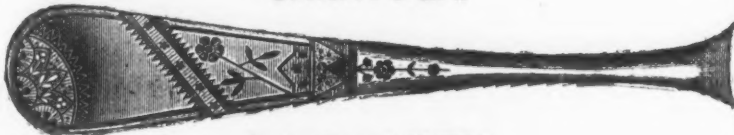
REGAL.

Patented Jan. 20, 1880.
Same price as "OLIVE."

Post Office Address,

DRAWER 30,
HARTFORD, CONN.

SARATOGA.



Same price as "OLIVE."

NEW YORK OFFICE, NO. 100 CHAMBERS STREET.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



THE "NIAGARA."

Factories, Wallingford Conn.

Salesroom, 75 Chambers Street, New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

Finest Quality Silver-Plated Spoons, Forks, Knives, &c.

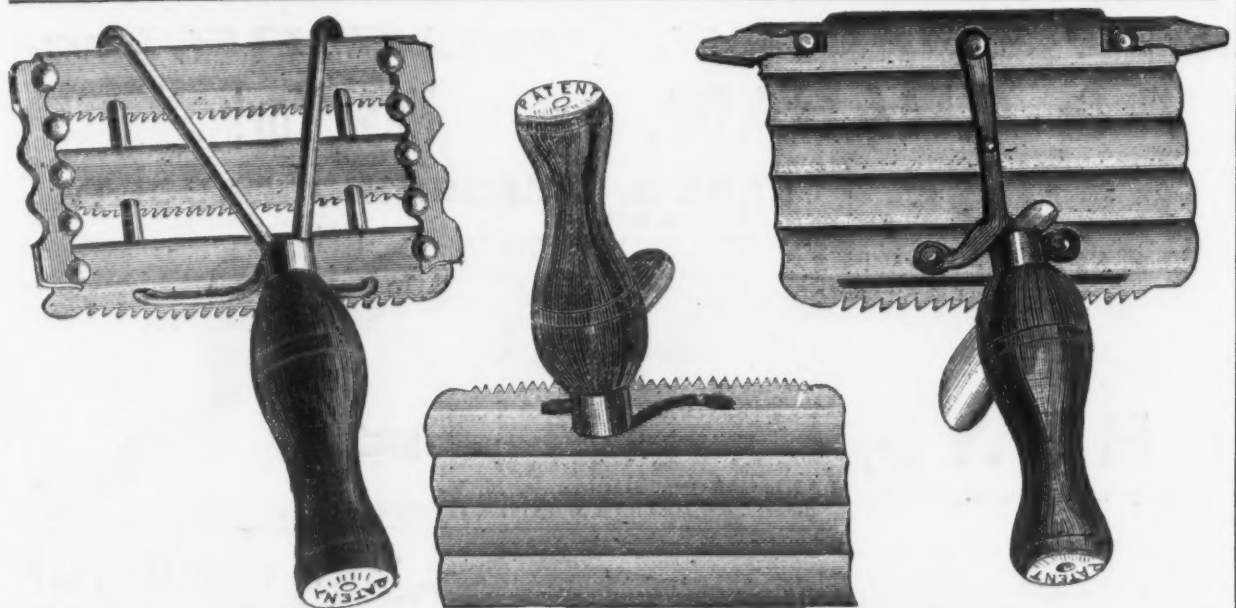


NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 12 per cent. Nickel Silver, and extra heavily plated with pure Silver. Our goods are all hand burnished, and are first-class in every respect. We pack our Spoons and Forks one dozen in each box.

49 CHAMBERS ST.,
NEW YORK.

Factories,
WATERBURY, CONN.

18 FEDERAL ST.,
BOSTON.



Our arrangement with Messrs. Graham & Haines as agents for our goods having expired, we shall hereafter have no agencies, but shall sell our own goods direct to the trade. We are confident it will be to your advantage to defer buying any Combs until you have inspected and priced our new lines.

"THE PIONEER,"

which we are manufacturing in connection with the "PERFECT," but which are not subject to the conditions governing the prices of the "PERFECT," and are universally acknowledged to be the best low-priced Combs ever offered to the trade.

Catalogues with Discounts, &c., sent on application.

LAWRENCE CURRY COMB CO.,

309 EAST 22d STREET, NEW YORK.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,

Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools,

FOR SALE BY

MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

GLOBE HARDWARE CO.,

Manufacturers and Dealers in

General Hardware

53 BECKMAN ST.,
NEW YORK CITY.

touching lines through Central America in passing. In fact, as we learn from another source, the contract calls for a line to Goatscoacos, where the Tehuantepec Railway Company has fixed its western terminus.

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

Sibley's Scythe Company, at North New-
port, intend to manufacture 3500 dozen
scythes.

MASSACHUSETTS.

The South Boston Iron Works finished a
large casting weighing 72 tons, several days
ago, for a mining concern in Pennsylvania.
The Lanesboro Iron Company's furnace is
making about 10 tons a day of pig iron at
present.

The American Bolt Company, of Lowell,
which have been running as a firm since 1850,
have just been incorporated, with James Min-
ter, as president, and Robert H. Butcher,
treasurer and agent. It is one of the oldest
and most reliable bolt manufacturing
concerns in the country, employs upward
of 100 hands, and produces about 20,000
bolts of all the different kinds daily, besides
nuts, washers, &c. These goods are sold all
over the country, and have an enviable rep-
utation wherever used. Their factory is built
of stone, 175 feet long by 60 feet wide, and
supplied with all the best machinery and modern
conveniences. Both water and steam power
are used. Mr. Butcher has charge of the
manufacturing department, as well as the
financial, and his 18 years' experience,
coupled with rare good business judgment
and mechanical skill, contributes largely to
the success of the company.—*Boston Com-
mercial Bulletin.*

Work is being pushed at the Brown ore
bed in Cheshire by a small force of men. A
shaft has already been sunk about 50 feet,
and some signs of ore have been discovered.

Business at the Douglas Ax Company's
Works, at East Douglas, is exceedingly
brisk, the numerous pressing orders com-
pelling them to run a portion of the works
day and night. On account of the failure
of the water supply, they have put in two
heavy portable engines, one at the Lovett
mill, and the other at the Howe factory.
Besides these, they have a large stationary
engine at the Bitt shop, which enables them
to carry on a large part of the forging, most
of the finishing being done at the two first-
named places.

The George F. Blake Manufacturing Com-
pany, of Boston, have completed a large
addition to their factory. They have just
shipped one of their improved duplex high-
pressure pumping engines, of 2,500,000 gal-
lons daily capacity, to furnish water for the
city of La Crosse, Wis., and are now erect-
ing at Maysville, Ky., two vertical pumping
engines of 3,500,000 gallons combined cap-
acity. This company have a large number of
orders, and are running full on extra time.

NEW YORK.

D. M. Osborne & Co., of Auburn, have
contracted for 2,000,000 bricks for additions
to their already extensive mow and reaper
factory. Their gray-iron foundry is melting
over 30 tons of iron per day, to supply a
molding floor 107 x 300 feet. New machinery
is constantly being added in other depart-
ments.

The mill of H. Burden & Son, Troy, shut
down last week on account of an accident to
the driving wheels, and will probably have
to remain idle for two weeks.

John H. Thompson & Co., 32 Pine street,
this city, have been appointed agents for the
sale of the Conewago Iron Co.'s iron.

The Gracie Furnace, at Port Leyden, Lewis
County, one of the two stacks owned by the
Gore Iron and Mining Company, is in blast
making 165 tons per week from native
hematite and Salisbury ores, of a superior
value for car wheels and malleable castings.
It is a 42 x 9 stack, built in 1864. Their No.
2 furnace is ready for blowing in, but will
remain idle until spring for want of a char-
coal supply.

NEW JERSEY.

The creditors of the Adirondack Steel
Works in Jersey City, which are owned and
operated by Gregory & Co., met a few days
ago to ascertain the financial condition of
the business, about which injurious rumors
have recently been circulated. Benjamin
Gregory and Dudley Gregory are the principal
partners in the firm. They have not, of
late, been able to agree. In consequence,
the standing of the company, it is said, be-
came seriously impaired. It is estimated
that the liabilities do not exceed \$25,000,
while the assets aggregate more than twice
that amount. The latter consist mainly of
real estate. The creditors, after a prolonged
discussion, made an arrangement whereby
the control of the business will be vested in
Benjamin Gregory until the obligations are
discharged. A committee was appointed to
examine the accounts and exercise supervi-
sion of the business.

PENNSYLVANIA.

The L. B. Flanders Machine Works are at
work on orders for locomotive cylinder
boring machines for the Lehigh Valley Rail-
way Company and the Wisconsin Central,
and on valve-seat rotary planing machines
for the Chesapeake and Ohio and the Maine
Central railways. Inquiries for the special
tools made at the Flanders Machine Works
are very numerous, chiefly from railway re-
pair shops.

The Pottstown Iron Company are about to
try the experiment of carrying hot iron
from the blast furnace to the puddle mill in
a car that will run on a railroad track be-
tween the two buildings. At present the
iron is run into what are known as bars of
pig iron and then carted to the mill, where
it is thrown into the furnace when cold and
melted in the regular way. At each puddle
furnace two additional helpers will be em-
ployed, and it is thought that several addi-
tional heats can be made daily, thus increas-
ing the quantity of iron made each day and
furnishing employment to more men. The
distance between the blast furnace and the
puddle mill is upward of 100 yards and the
track is a narrow gauge.

The Kittanning Rolling Mill has been put
in order, and has started up with orders
enough to keep the fires lighted for over two
months.

In the Bessemer department of the Beth-
lehem Iron Company's works the following
tonnage of steel rails was produced during
the year 1880: A turn produced 37,400 tons,
and B turn, 37,980, a total of 75,380 tons.
Both turns lost 12 working days during the
year, including holidays and stoppages.

A limited stock company is being formed
in this city to engage in the manufacture of
agricultural implements and machinery.
The capital stock is to be not less than
\$50,000, subscriptions to which are being
received. The prospects of having the en-
tire amount subscribed in a short time are
said to be encouraging.—*Reading Eagle.*

The total tonnage of anthracite coal mined
and sent from all the regions, as reported
by the general carrying companies, for the
year ending December 31, 1880, was 23,-
638,866 tons, against 26,300,736 tons for the
same period last year, a decrease of 2,670,-
870 tons. The total amount of bituminous
mined for the year was 4,251,452 tons,
against 3,732,218 tons for the year 1879, an
increase of 609,236 tons. The total tonnage
of all kinds of coal for the year 1880 was
27,980,318 tons, against 30,041,952 tons for
1879—showing a decrease last year, com-
pared with the year preceding, of 2,061,634
tons.

PITTSBURGH AND VICINITY.

A portion of the Sligo Iron Works had to
shut down a couple of days this week on ac-
count of a scarcity of muck iron.

The Pittsburgh Forge and Iron Company
are running double turn and are in receipt of
a good run of orders.

Alexander Nimick, George P. McBride
and John S. Slagle, partners as Nimick and
Co., have brought suit in Wheeling against
a large number of West Virginia stock-
holders of the Mingo Iron Company. The
case was recently settled by a commissioner
at Steubenville, who decided that the stock-
holders who were served in the action were
liable to the creditors for an amount equal
to the amount of their dividend stock. The
stockholders claim that they cannot be held
liable.

The Pittsburgh Tinware Company (Lim-
ited) was established in this city last Feb-
ruary, and has been working on orders en-
tirely up to the present time.

VIRGINIA.

The zinc works located at Martin's, Pulaski
County, are turning out 4000 pounds of spel-
ter per day of excellent quality.

WEST VIRGINIA.

The Riverside Nail Factory has started
up.

OHIO.

The Chambers automatic elevator hatch-
way doors are so constructed that when
the elevator carriage passes up or down
they are opened, and when the car-
riage passes through they are closed. The
construction of the frame of the carriage is
diamond-shaped. When the carriage is be-
low the doors the upper point of the frame
enters at the joint in the center between
the doors and raises them; the edge of each
door sliding on the inclined planes of the
frame are opened to a perpendicular posi-
tion. At the moment the center of the
frame passes, the doors are drawn toward
the center again by an ingeniously con-
structed device, and rest upon the two other
planes of the frame, closing all the time
until the point of the frame passes the point
opposite the hinges of the doors, at which
time the doors have again closed. One of
these elevators with the Chambers improve-
ments is in successful operation at No. 139
Main street, Cincinnati.

The Hughes Cultivator Company, at Ham-
ilton, have done a fair business in the past
year, and are expecting a heavy trade this
year. They manufacture as a specialty the
Hughes castor rolling coulters, with patent
hub and clamp and the Mead tucker attach-
ment. Over 50,000 of these coulters are
said to be in use, giving entire satisfaction.
They are used with the Hughes sulky break-
ing plow, now manufactured by the Long &
Alistatter Company at Hamilton, and may
be attached to any plow. Besides this they
manufacture several valuable specialties in
the line of agricultural implements, among
which is their new spring-toothed harrow
and pulverizer.

Every furnace in the county was in blast
last year excepting Vesuvius, and present
indications point to the same activity the
present year, with an increased production.
The tons of pig iron made in 1880 are shown
by the following figures:

Furnace.	Tons.	Furnace.	Tons.
Sarah.....	11,000	Grant.....	2,400
Mt. Vernon.....	2,400	Center.....	2,200
Belfont.....	12,475	Buckhorn.....	1,000
Hedra.....	2,983	Olive.....	2,500
Alice.....	8,000	Iron and Steel.....	2,000
Etna.....	2,000	Monitor.....	1,200
Lawrence.....	1,900		
Pinegrove.....	4,080	Total.....	56,538

Iron and Steel Furnace blew in November 4.
The production of Alice has been restrained
on account of the scant supply of ore.
It is likely that the present year will de-
velop better facilities in this direction.
Sarah Furnace made wonderful time in
1880—missing only three days in the entire
year. Several of the charcoal furnaces were
late in starting, and now have sufficient
stock ahead to run late in the spring.—
Ironton Register.

INDIANA.

The Atlas Engine Works, Indianapolis,
are running full, employing about 350 men,
and are much crowded, especially with
orders for their large Corliss and slide
valve engine-work. Being prepared to make
both engines and boilers on a large scale,
they are receiving many choice orders for
entire outfits for steam-power. They claim
to have the best plant of machinery, tools,
patterns, &c., to be found west of Pitts-
burgh. They are now building a 300 horse-
power engine with boilers and shafting for a
large lumber company in Minneapolis, and a
350-horse-power Corliss engine and other
machinery for a similar enterprise at Winona,
Minn.

ILLINOIS.

The Thorn Wire Hedge Company will
place in their new factory, on Clinton street,
an improved double-acting Corliss engine
and boiler of 180-horse-power, and 12 more
barbing machines with a capacity of 30 tons
every 24 hours. The work will be in run-
ning order March 1st.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

PLATTSBURG, N. Y.

J. W. LYNDE, Secretary.

ELY & WILLIAMS, Gen'l Agents for Eastern and Middle States, 1232 Market St., Philadelphia; 178½ Water St., New York;
36 Oliver Street, Boston. S. H. & E. Y MOORE, Gen'l Agents for Western States, 163 and 165 Lake Street, Chicago, Ill.

SAM'L G. B. COOK & CO., Agents for Southern States, Nos. 67 and 69 (old Nos. 5 and 7) German Street, Baltimore, Md.

SARANAC HORSE NAILS,

Blued or Polished.

Terms, Cash, within 60 Days.

Nos.	5	6	7	8	9	10
Cts.	26	23	21	20	19	18

THE UNION METALLIC CARTRIDGE COMPANY,

Bridgeport, Conn.

GUN WADS.

We desire to impress upon the trade the Fact that Black and Pink Edge Gun Wads, now manufactured by us, are Unequaled in Quality, and afford jobbers a larger Margin of Profit than the Imported.

CENTRAL FIRE WATER-PROOF PERCUSSION CAPS,

BRASS & PAPER SHOT SHELLS, PRIMERS, &c.

Agents:

HARTLEY & GRAHAM,

New York.

THE PATENT SELF-FEEDING STAPLE SET-TER FOR WIRE FENCES.



Holds 50 Staples, saves one man's work, saves torn hands and mangled fingers, enables barbed fence to be put up in the coldest weather and with thick gloves, and is warranted of the best steel and malleable iron. Price, \$5.00 each.



For Illustrated Catalogue of our own patented specialties, address Phila. Novelty Manufg. Co., 321 Cherry St., Philadelphia, Pa. Export Agents, Fairbanks & Co., 311 Broadway, N. Y.

T. NEW'S
PREPARED
ROOFING

For steep or flat roofs. Applied by ordinary workmen at one-third the cost of tin. Circulars and samples free.

NEW, 39 John St., New York.
BARRETT, ARNOLD & KIMBALL, Western Agts., Chicago, Ill.

GEORGE W. BRUCE,

No. 1 Platt Street, New York,

PROPRIETOR OF THE ATLANTIC SCREW WORKS,

MANUFACTURER OF

IRON AND BRASS FLAT AND ROUND-HEADED

WOOD SCREWS,

Of all kinds, of Superior Quality and Finish.

AGENT FOR

THE FLORENCE TACK CO.'S

TACKS, BRADS AND FINE NAILS,

Of every description, for home and export trade, and

C. A. MAYNARD'S

C. S. HOES, PLANTERS', HILLING, BOG AND FIELD SHOVELS,
SPADES AND SCOOPS AND BRICK TROWELS,

OF ALL PATTERNS.

Offers from stock an assortment of

Nettlefolds' Screw Eyes, Hooks, &c., and Rivets, Jack

Chain, single and double; Thrall's Rules;

Burden's Horse and Mule Shoes;

Ausable, Canton and Vermont Horse Nails.

BRASS
PADLOCKS

IMPROVED PADLOCKS for Railway Switches and Freight Cars, used by many leading roads; also, Master Keyed Padlocks for Tool Houses, &c. The above made to order only, and have flat steel Keys. Our well-known six and seven tumbler cast brass Padlocks, with or without Chain or Nickel plating, are handled to good profit by both home and foreign trade. We guarantee to make no two keys alike in a million. For security, durability and convenience, skilled mechanics say they have no equal.

D. K. MILLER LOCK COMPANY, Philadelphia, Pa.

LANE'S MEASURING FAUCET.

Price, \$3.00.

For Light or Heavy Molasses, Oils,

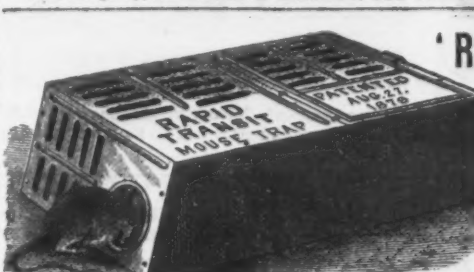
Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any measuring faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY

LANE BROS., Millbrook, N. Y.

General Agency, GRAHAM & HAINES, 113 Chambers St., New York.



Patented August 27, 1878.

Manufactured by

THE SMITH & EGGE MANUFACTURING CO., Bridgeport, Conn.

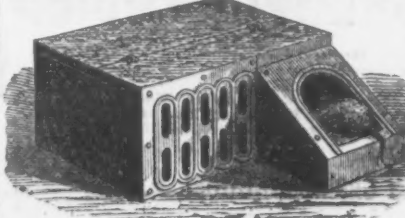
Delusion Rat and Mouse Trap,

Manufactured by

CLAUDIUS JONES & CO.,
ERIE, Penna.

This is the only Self-setting Trap on the market, and the most successful. All orders direct to

CLAUDIUS JONES & CO.,
ERIE, Penna.





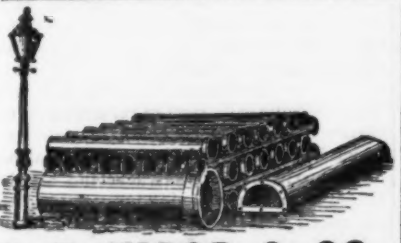
FRANKLIN S. MILES,
Manufacturer of
Brass, Iron, Steel and German Silver
SCREWS,
205 Quarry Street, Philadelphia.

SPENCER & UNDERHILL,

94 Chambers St., New York, Agents for
American Screw Co.'s Wood Machine and
Rail Screws, Stove and Tire Bolts, Rivets, &c.
G. F. Warner & Co.'s Carriage Clamps.

DEPOT FOR

O. Ames & Son's Shovels, Spades and Scoops.
A. Field & Son's Tacks, Brads, Nails, &c.
Nicholson File Co.'s Files and Rasps.
W. & S. Hatcher's Chisels, Gouges, Plane
Irons and Cleavers.
E. W. Gilmore & Co.'s Strap and T Hinges.
Russell Jennings' Auger and Dowel Bits.
Also a general assortment of Hardware.



R. D. WOOD & CO.

Philadelphia,
Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,
Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.

N. Y. Mallet and Handle Works



Manufacturers of
Calkers', Carpenters', Stone Cutters'
Tin, Copper and Boiler Makers'
MALLETs,

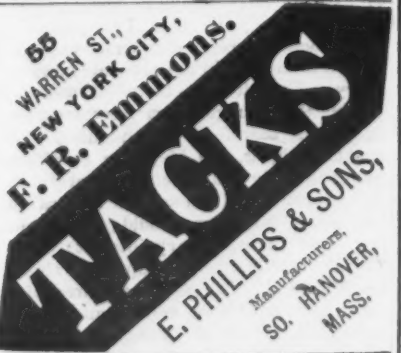
Hawking Beets, Hawking and Calking Irons;
also all kinds of Handles, Sledge, Chisel and Hammer
Handles. Also
CUTTING AND BALE HOOKS.
Patented Feb. 13, 1877; a new combination of hooks.
446 E. Houston St., New York City.

ESTERBROOK'S

STANDARD
and
RELIABLE



ESTERBROOK STEEL PEN CO.
Works, Camden, N. J. 26 John St., New York.



W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship Chandlery Hardware,

No. 33 Chambers St., New York.
JAMES COMLY,
4739 Paul St., Frankford, Philadelphia, Pa.
Manufacturer of



Hardware Novelties, Glass Cutters, &c.

Vulcanized Rubber Fabrics

ADAPTED TO
MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.

Machine Belting,
Steam Packing,
Leading Hose,
Suction Hose,
Grain Elevator
Belting,
Steam Hose,
Piston-Rod
Packing,
Gaskets and Rings.



Vacuum Pump
Valves,
Ball Valves,
Car Springs,
Wagon Springs,
Gas Tubing,
Machine Belting,
Wringer Rolls,
Billiard Cushions,
Grain Drill Tubes,
Emery Wheels.

This company manufactures the immense DRIVING and ELEVATOR BELTS for the Buckingham
Elevators at Chicago, which have been running perfectly for more than twelve years, also those for
Armour, Dole & Co., Chicago, and Vanderbilt's great elevators of the New York Central and Hudson R.
R. R., New York, being the largest belts in the world. We are now making an Elevator Belt, 35
inches wide and 200 feet in length, which will weigh over 15,000 pounds.

LINEN and COTTON HOSE,

Pat. 6545.

Plain and Rubber Lined.

Pat. July, 1873.



Circular Woven-Seamless Antiseptic RUBBER
LINED "CABLE" HOSE and "TEST"
HOSE, Vulcanized Para Rubber and Carbolized Duck,
for the use of Steam and Hand Fire Engines, Force
Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.



"TEST" HOSE.

"CABLE" ANTISEPTIC.

Emery Wheels and Packing.

Patented.

ORIGINAL

Solid Vulcanite EMERY WHEELS

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these wheels are such that they can be used with great advantage and
economy for cutting, grinding, and finishing Wrought and Cast Iron, Chilled Iron, Hardened
Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hard-
ware, Cutlery, Edge Tools, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agri-
cultural Implements, and small Machinery of almost every description.

Pat. Jan. 26, 1866.

Rubber Back Square Packing

BEST IN THE WORLD.
For Packing the Piston Rods and Valve Stems of Steam Engines and Pumps.

B represents that part of the packing which, when in use, is in contact with the Piston rod.
A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight,
and yet creates but little friction.
This Packing is made in lengths of about 25 feet, and of all sizes from 1/4 to 2 inches square.

Corrugated Rubber Mats and Matting,

Pat. 11,208, 213,601.

For Halls, Flooring, Stone and
Iron Stairways, &c.

Pat. July, 1879.



This practical and indispensable article—
especially for wear where exposed to
ice, snow, or slush—was first intro-
duced by this company several years
ago, and its real value is in being
almost indestructible, when
proper materials are used in
its manufacture, whilst the cheap,
inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle
and crumbles to pieces. Address



NEW YORK BELTING & PACKING CO.,
Warehouse, 37 and 38 Park Row, New York.

JOHN H. CHEEVER, Treasurer.

TACKS & NAILS.

CUT TACKS, SHOE NAILS, WIRE NAILS,

Pat. Brads, Finishing Nails, Clout Nails, Trunk Nails, Hungarian Nails,
Cigar-Box Nails, Basket Nails, 2d and 3d Fine Nails.

Carpet Tacks, Upholsterers' Tacks, Gimp and Lace Tacks, Brush
Tacks, Copper and Brass Tacks,

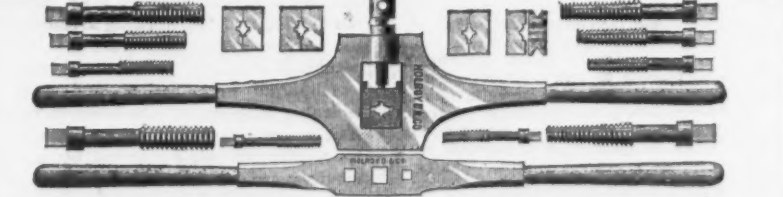
BRASS AND IRON ESCUTCHEON PINS, &c., &c.

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN, So. Abington Station, Mass.

New York Salesroom, 39 Warren St. Goods made to order from sample.

Particular attention given to orders for EXPORT.



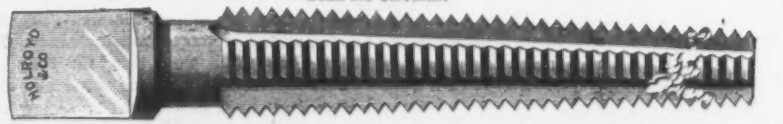
HOLROYD & CO., Waterford, N. Y.,

Manufacturers of

STOCKS AND DIES,

For Blacksmiths, Machinists and Gas Fitters.

Send for Circular.



RICHARD DUDGEON,

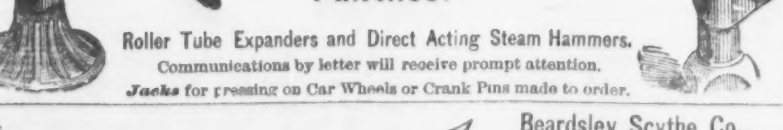
No. 24 Columbia Street, New York,

Maker and Patentee of the Improved

Hydraulic Jacks

AND

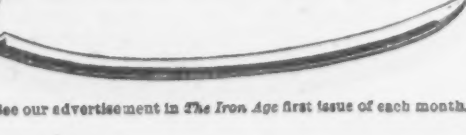
Punches.



Roller Tube Expanders and Direct Acting Steam Hammers.

Communications by letter will receive prompt attention.

Jacks for pressing on Car Wheels or Crank Pins made to order.



Beardsley Scythe Co.,
Manufacturers of
GRASS, GRAIN & BUSH SCYTHES,
Hay Knives & Corn Knives.
West Winsted, Conn.

See our advertisement in The Iron Age first issue of each month.

The Manny Manufacturing Company, of
Rockford, will, it is expected, assume con-
trol of the Elgin Agricultural Works about
the 1st of July next. Manny is to pay \$100
rental per month.

The Hercules Iron Works, of Chicago,
commence the new year with new contracts
amounting to \$33,000.

The Union Iron and Steel Company have
been closed down for several days. They
are making their general yearly repairs at
the mills. Among the important repairs
may be mentioned the taking out of the
13-ton hydraulic plunger, used for moving
cranes and carting the same across the city
to the Hercules Iron Works, on Canal
street, where it is to be turned down. The
mills will probably be running again in about
two days.—*Industrial World.*

The Illinois Iron and Bolt Company, the
Star Manufacturing Company, the Atlantic
Mills and all other manufacturing places at
Carpentersville, have been compelled to
shut down on account of low water in the
Fox River, throwing nearly 400 men out of
work.

MISSOURI.

On the 13th instant the Cheever & Bur-
chard Cutlery Company, of St. Louis, made
an assignment to R. Wood Crittenden. The
nominal capital is \$100,000; paid in, \$80,000.
The cause of the failure is not known, but
reports say it is overtrading on a credit
basis. The creditors are principally in New
York, Connecticut and England. The pre-
sent corporation is about a year old. Prior
to that the name of the firm was Cheever,
Burchard & Co.; and still earlier, Warne,
Cheever & Co., one of the best-known houses
in the West.

The Vulcan Steel Works, of St. Louis, are
in full operation. The blast furnaces, how-
ever, are all out except Jupiter Furnace,
which is in operation.

The Glendale Zinc Furnace, at Carondelet,
has been out of blast for several weeks. All
the other furnaces are at present in blast.

KENTUCKY.

The Norton Iron Works during 1880 man-
ufactured 223,000 kegs of nails, their fur-
nace making 10,840 tons of pig iron.

The Mt. Savage Furnace was to have
blown out last Sunday, when T. B. Walker's
(the late lessee) term expires, to be followed
by Joseph S. Woolfolk, lessee. Mr. Wool-
folk contemplates a blast of about 10,000
cords of wood.

During the year 1880 the Ashland Furnace,
running only on raw coal for fuel, made
13,787 tons of pig iron, running in all 287
days, which is equal to a daily average make
of 48 1/2 tons per 24 hours.

MICHIGAN.

We understand that negotiations for the
sale of the Milwaukee mine are going on, a
refusal having been given parties in Cleve-
land at \$140,000, which would seem to be
a low price for a mine well equipped with at
least 100,000 tons of No. 1 ore in sight, and
a reasonable certainty that the deposit is
nearly inexhaustible. A shaft is being sunk
preparatory to opening a pit for working.
400 feet west of the recent discovery known
as the Ryan pit. The shaft is now down 15
feet in a fine quality of ore, which is particu-
larly gratifying, as it clearly indicates the
existence of the vein between it and the
Ryan pit. How far west of the new shaft
the deposit extends of course remains to be
decided by future exploration.—*Negaunee*
(Mich.) *Herald.*

From April 3 to June 26, and from Oc-
tober 8 to December 31, last year, Deer
Lake Furnace, at Ishpeming, made 2297 1/2
tons of metal. The furnace was out from
June 26 to October 8. Since October 8 she
has averaged 15 1/2 tons per week, consum-
ing on an average 105 bushels to the ton.
The company is building a new engine and
boiler house.

The Michigan Chemical Company will
erect at Elk Rapids extensive works for the
manufacture of acetate of lime and wood-
alcohol, from the smoke and gases which es-
cape from the 35 charcoal kilns belonging to
the Elk Rapids Iron Company.

The Champion Furnace, Menominee, is
being thoroughly repaired and put in good
order.

Work has been resumed at the Cambria
Mine.

The Jackson Furnace, at Fayette, made
an aggregate of 9741 1/2 gross tons of pig
metal in 1880.

The Martel Furnace, building at St.
Ignace, Mich., is under the management of
Mr. H. E. Burt, and will be well equipped
in all respects. The fuel will be charcoal.
The stack is 53 feet high, with 10 1/2-foot
boilers. Two Whitwell stoves, 15 feet in
diameter and 60 feet high, will be used.
There will be four boilers, in batteries of
two. The blowing engine cylinder is 48
inches stroke and 72 inches diameter. The
location is well selected, at the eastern
terminus of the Detroit, Mackinaw and
Marquette Railroad, on one of the best
harbors on the lakes. It is expected that
the furnace will be ready to blow in about
June 1, 1881. The proprietors are owners
of the Erie (Pa.) Car Works, and in the
manufacture of wheels and car castings will
consume a large part of the output of this
furnace, which it is expected will be about
60 or 70 tons per day. It is intended to
blow only six days in the week, observing
the Sabbath.

Brazilian Trade.—The report of Hon.
Thomas Adamson, American Consul Gen-
eral at Rio Janeiro, suggests that it would
pay our large manufacturers to station an
agent at that city, the flourishing capital
of the Brazilian Empire, a man conversant
with the Portuguese language and the usages
of mercantile business, and who would not
attempt to import goods until he had care-
fully studied the peculiarities of the market,
the wants of the country, the many peculiar
provisions of the tariff and the rulings of
customs officials, as well as the style in
which goods should be put up, size of pack-
ages, mode of packing, &c. If such a man
cannot be found, the next best thing is to
find a resident firm possessing these quali-
fications, and then do business through such
a firm and such only. In General Adam-
son's opinion there is a market there for a
greater variety of cotton goods and iron-
ware, for plated ware, glassware, planta-

tion machinery, paints and various chemical
substances, hams, sides of bacon, cheese,
beans, dried fruits and potatoes, and for
some, at least, of the small wares in which
hitherto Germany has undersold us. He is
hopeful of the future of our trade there,
but says: "Our people may as well dis-
abuse their minds of the idea that this is a
new Japan, just opened to commerce, and
that the people of Brazil are particularly
anxious to trade with us above all others.
There are a great many popular fallacies to
be got rid of. Just before the writer of
this left home, a speaker at a public meet-
ing in Philadelphia gravely told his audience
that the Brazilians were very anxious to
buy of us, but that our high tariff on wool
compelled them to take their wool to Europe
for sale, and when there they supplied their
wants in European markets." To this he
replies that Brazil has hardly any wool to sell,
her total shipments last year being less than
those of many a single county of Ohio.

Tools for the Boys.

The following article, though specially
written for *Carpentry and Building*, con-
tains much that is valuable to mechanics
in other besides the building trades, and
to parents generally. Wood-working tools
are valuable in every household, and a little
knowledge of their use often makes a great
saving in household expenses.

We suppose there is scarcely one carpen-
ter in a hundred who has not "cracked the
commandment," to say the least, when com-
ing into the shop and finding that one of his
boys has been trying to do some kind of
rough work with a favorite plane or chisel.
Now we don't think that it is fair of the boy
to work with his father's best tools, for the
old man is pretty certain to have all the
labor of putting them in order and the
youngster all the practice in dulling them.

No matter whether the boy intends to be
a carpenter or not, see to it that he has tools
to work with. The assortment need not be
large, but let them be his own. Let them
be of fair quality and teach him how to
keep them in first-class order. But, some one
says, I have no boys, my children are all
girls. Well, it will do no harm for the girls
to learn to drive a nail, saw a board off,
square and joint the edge, or even go so far
as to make a box. Certainly the carpenter's
daughter ought to know how to do some of
the easier or simpler things which require
tools, for she usually needs this knowledge
more than the daughters of other men. The
old proverb suggests the reason: "The
shoemaker's children have to go barefoot,
&c." Where girls have this knowledge they
are more independent in a great many things,
and are able to help themselves and carry
out their own ideas, in difficult places where
they are usually helpless.

The outfit for a boy need not be expen-
sive. A square, a couple of planes, ham-
mer, draw shave and bit stock and a few
bits, half a dozen chisels, and, lastly, a bench
screw are ample. The boy should have a
bench of his own, and either a tool chest or
some other place where all his tools may be
kept by themselves. Of the "supplies"
that he needs most he should have a small
stock of his own, so that he be not com-
pelled to "crib" from the old man's boxes.
Usually the carpenter's son easily learns
how to handle the tools. The important part
is to teach him how to take care of them.
If the parent would have the boy work with
his own tools in preference to any others,
care should be taken to make the boy keep
them in first-class condition all the time.
There will be then little temptation to use
other people's tools.

No matter what condition in life the boy
may find himself this knowledge will always
be useful, and it will give him a command
over circumstances that will be of great
assistance in after life, whether in city,
town or country.

Don't put off getting the tools too long.
The sooner a child learns to make his own
playthings the happier will he be, and the
less likely to fall into evil company. A toy
shop full of playthings will not give any
child half the amusement that he can gain
from any little tool by which he is enabled
to make something. Remember this when
you are at your wit's end to keep your
children amused, happy and out of mis-
chief.

**How to Find a Flaw in a For-
ging.**—It is well-known that in working iron,
such as welding two pieces together, and even
in its manufacture, hollow places or flaws
occur, with merely an outside skin over the
defective parts, which any test but a de-
structive one would fail to discover. Nor
would it be difficult to point out numerous
examples of disaster thus occurring. To
test the homogeneity of the metal, says the
Scientific American, a bar of iron is placed
on the equatorial line. A compass with a
very sensitive needle is passed along in front
of the bar, the needle of course pointing at
a right angle to it. If the bar is perfectly
solid through its whole length, the needle
will remain steady. If, however, there
should be a flaw or hollow place in the bar,
the needle will be deflected as it passes from
the solid to the hollow place, backward to-
ward the solid iron; passing on over the
hollow place, the needle will come within
the range of the solid iron at the other end
of the flaw, and will again be deflected for-
ward. If the bar be cut through anywhere
between these two points of deflection, a
flaw will invariably be found. Many thou-
sands of pieces of iron—some prepared for
the purpose of testing this method of trial,
others in the ordinary course of business—
have been operated upon with the same un-
varying result.

Failures in England.—The statistics of
failures in England and Wales for the whole
period from the first issue of *Kemp's Mercan-
tile Gazette* to the end of 1880, are as follows:

Year.	Totals.	Year.	Totals.
1867	15,850	1875	9,704
1868	15,800	1876	10,845
1869	10,518	1877	11,247
1870	8,151	1878	13,620
1871	8,164	1879	15,739
1872	8,112	1880	12,471
1873	9,064	Scotland, 1880	870
1874	9,250	Ireland, 1880	245

The Iron Age

AND
Metallurgical Review.

New York, Thursday, January 20, 1881.

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There is a movement in Germany against
the present methods of teaching in the
higher technical schools. Manufacturers,
and those in charge of great railway and
industrial enterprises, complain that the
graduates, who are crammed with scientific
information, lack any correct appreciation
of practical questions. While conceding the
importance of studies of a higher order,
they protest against the waste of time which
too much devotion to them entails. They
urge that, although forming a valuable basis
for the solution of complex problems, the
utility of these studies is overrated, and
they attribute this fact to the circumstance
that many of the professors have either lost;

all their connection with practical work, or
have not during their career had any expe-
rience whatever. In the beginning of the
development of the present system of tech-
nical education, eminent men from the
ranks of the profession were chosen to as-
sume the duties of instructors. Now young
men of talent are, after graduation, ap-
pointed assistants and adjunct professors,
and in time take the place of their prede-
cessors, without ever having had any full
insight into the actual practical require-
ments of the professions, for which they
are expected to prepare their students. The
ambition of this rising generation of sci-
entific gentlemen appears to be for elaborate
mathematical treatises, for which the world
is no doubt much indebted to them. But
they err seriously when they assume it to be
their duty to make such works the text
books for their respective colleges. A train-
ing in higher mathematics is undoubtedly of
much value to a mechanical or civil engi-
neer, but we do not hesitate to express the
opinion that less than five per cent. of the
graduates of colleges have ever in after
life made direct use of calculus, for in-
stance. In Germany, where the teaching of
abstract science has been carried to excess
in colleges, a reaction is now setting in. In
this country we are far from that danger
yet, but still there are indications of a ten-
dency in that direction, which we trust the
good common sense and business tact of the
trustees of our colleges will check ere it be-
comes menacing to their utility.

Liability of Employers for Accidents.

Another case of considerable interest in
respect to the liability of employers for in-
jury to workmen, has just been decided by
the Supreme Court of Pennsylvania. It is
the case of *Bedell against the National Tube
Works*, and is very similar to the case
against the Keystone Bridge Company
which we have already commented upon.
As in that case, the lower court gave judg-
ment against the company and the Supreme
Court reverses the decision.

The facts of the case are these: The com-
pany had leased a rolling mill which was out
of repair. The general superintendent and
manager of the company was Mr. Jackson,
and Mr. Eardly was a millwright and ma-
chinist under daily pay, and had been for
some time in the employ of the company.
Jackson sent Eardly to take charge of the
work in repairing, and, as an inducement to
its more speedy completion, was to pay him
an extra sum of \$50 therefor. A part of
the repairs required was the adjustment of a
fly-wheel and the putting of a heavy beam
on each wall of the pit in which the wheel
was to revolve. The larger timber had been
raised and put in place by means of a rope
and chain tackle and crane, worked by a
windlass. The same machinery was used in
raising the shorter timber. Bedell was a
carpenter. He was employed by Eardly and
directed by him, but paid by the company.
He and one other were stationed at the
higher end of the timber, for the purpose of
screwing out on the ends of the bolts when
they passed sufficiently through the timber.
While the lower end of the timber was being
slowly raised, Bedell thought to expedite it
by pressing down the upper end. With this
view he threw a jack-screw on the end of the
timber, rested one hand on the top of the
timber, and with the other picked up a block
to put on the screw. Just at that moment
the hook of the chain broke, the lower end of
the timber fell and the upper end flew up,
crushing his hand between it and the block
on which the cylinder plate rested.

The court, in passing upon the appeal,
states that the action was based on a tort.
It rests on the alleged negligence of the
company. The burden of proof was on the
defendant in error to establish the negli-
gence. We quote as follows:

There is no evidence that the company had any
notice that Eardly was not a careful and compe-
tent person to perform the work to which he
was assigned, nor do we find any showing that, in fact,
he was not careful and competent. It therefore
follows that the company was not guilty of negli-
gence in putting him in charge of the work. The
general superintendent did not direct in what
manner nor with what appliances the timber
should be raised. The company had other chains
and of a larger size than the one used. Eardly
selected one which he thought suitable. He tes-
tified that he made an examination of "every link
and ring and hook" of the chain. The body of the
chain was about nine-sixteenths of an inch. The
hook was one and one-eighth inches in diameter.
The witnesses for Bedell testified that the chain
was rusty, and that Eardly was told that it was
too weak for the purpose. Both of these facts
were denied by the witnesses of the plaintiff in
error. No witness swears that any doubt was ex-
pressed as to the sufficient strength of the hook
but it was to the chain generally. It was the hook
only that broke, although it was twice as large as
the other part of the chain. The smaller part
stood the test and showed no failure of strength.
The evidence is that the timber weighed less than
four tons. About one-third of it rested on the
wall, so that only two-thirds of its weight was to
be raised by the tackle. The hook exhibited no
flaw, and in the opinion of experts its tensile
strength was such that it ought to have stood a
strain of 60,000 pounds, or 70 tons. This is fully
ten times the weight of the part of the timber
raised by the tackle. Thus, it appears, no one at
doubt, nor had any reason to doubt, that the
strength of the hook was sufficient for the purpose
to which it was applied. Eardly and Bedell were
co-laborers in the work. They were fellow ser-
vants in the same common employment. Although
Eardly was permitted to select some of the men
who were to assist in doing the work, yet he, as
well as they and all engaged therein, was hired by
the day and paid by the company.

The court laid down the law of liability as
follows:

A master is not liable to his servant for the neg-
ligence of a fellow servant while engaged in the
same common employment. (Sherman & Redfield

on Negligence, page 86.) The master does not
warrant the competency of any of his servants to
the other. It matters not that they are of
unequal grade, if the services of each in his par-
ticular labor is directed to the same general end.
And, although the inferior in grade is subject to
the control and directions of the superior, whose
act caused the injury, the rule is the same. *Whar-
Law of Neg.*, sec. 220; *Lehigh Valley Coal Co. vs.
Jones*, 5 Norris, 431; *Priestley vs. Fowler*, 3 Mee &
W., 6; *Wander vs. B. & O. R. R.*, 12 Md., 410. If,
then, we have shown that Eardly and Bedell were
fellow servants, even if the former were negligent
on the occasion of this injury, that fact is insuffi-
cient to charge the company with negligence in
appointing the negligent employee. *Whar.*, on
Neg., sec. 240; *Feltham vs. England*, L. R., 2;
Q. B., 13.

These two cases appear to have settled,
for the State of Pennsylvania at least, the
points laid down in the opinions of the Su-
preme Court; but the especial point of both
decisions is that an employer is not liable
for injury done an employee, even though
the employee may have been working under
the direction of another, unless it is shown
that the one under whose direction he was
working was a direct representative of the
employer, and unless he proceeded under the
direct orders of the employer to do the act
that caused the injury. Where the one hav-
ing charge of the work, not being a direct
representative of the employer, acts in his
own best judgment, and through an error of
judgment some injury follows, the employer
is not responsible, unless he knew that the
man in charge was unskillful or incompetent.

Boiler Explosions in Iron Works.

In a letter to the Editor of *The Iron Age*,
discussing the recent frequency of boiler ex-
plosions in iron works, Mr. J. W. Allen,
president of the Hartford Steam Boiler
Inspection and Insurance Company, states
that the observations and experiences of his
company lead to the conclusion that the
cause is largely carelessness. The rush of
business has brought many boilers into use
which for years have been idle, and they
have been put to what would be their full
capacity if in perfect condition. This con-
clusion seems to be warranted in the case of
the recent explosion at Allentown, although
the Hartford Company have not yet obtained
enough information on the subject to war-
rant them in expressing any opinion in this
particular case. Mr. W. W. Williams,
president of the Keystone Council No. 1, of
the Stationary Engineers of Philadelphia,
has made a report on the Allentown case
which, if justified by the facts, makes an
unpleasant showing. He says:

In the first place, I find malconstruction. The
malconstruction was in hanging the boiler at the
extreme ends and the cutting of the hole in
the shell the full size of the dome; also in
having the fourth sheet 3-16 inch iron, and the
fifth sheet 5-16 inch iron. The bad work-
manship I find in the riveting, the holes
not being even, and the rivets being too
small for the holes—the holes 1/4-inch and the
rivets 5/16 inch. From the evidence it appears that
the pressure has been carried far in excess for a
boiler of this size and thickness, as we estimate
the strength of a boiler by its weakest part. I
would judge the character of the iron, as it pre-
sents itself, able to sustain a tensile strength of
30,000 pounds per square inch, and reducing this
44 per cent., and taking the thickness of the iron
at 5-16, and the diameter of the boiler at 36 inches,
the bursting pressure would be 20 1/2 pounds. One-
sixth of the bursting pressure being the safe
working pressure (by our city ordinance) the safe
working pressure would be 8 1/2 pounds. This
would be the safe pressure for the iron that
gave way, the fourth sheet, while the fifth sheet
—being 5/16 iron—by the same rule it would have
a bursting pressure of 60 1/2 pounds, and a safe
working pressure of 25 1/2 pounds. This would be
the calculation for a new boiler of first-
class workmanship, and hung from three saddles
distributing the weight. Now, when we consider
the weight of the boiler at 6000 pounds, and a
weight of 5000 pounds of water, and of 3000 pounds
of brick and mortar laid on top of the boiler, there
is not much wonder that it gave way in the center,
particularly when assisted by at least 90
pounds per square inch on the head of the boiler,
which would be the mean between 60 and 120.
This would be equal to a force of 91,000 pounds on
the heads tending to pull the boiler apart in its
curvilinear seams. In its full strength, admitting
it to be equal to 32,000 pounds per square inch,
and reducing it 44 per cent. for riveting, its tensile
strain would be 1,018,300, and one-sixth of this
would be a safe load for it to bear. This is 171,-
56 pounds, and subtracting the pressure on the
heads (91,000) would leave us 79,778 as a surplus
to support the weight of the boiler, weight of water
and weight of brickwork, which would be 10,000
pounds. There is not much wonder that the boiler
gave way in the center, which, theoretically and
practically, is the weakest point when the boiler
is hung from the ends and there is no support for
the center. The boiler should, undoubtedly, have
been condemned before the last patch was put on.
It was evidently a great deal older than reported.

The subject of supporting boilers in pud-
dling and heating furnaces and in other
positions around iron and steel works, is one
which should receive a much more careful
and intelligent study from mechanical engi-
neers than they have yet considered it
necessary to give it. Comparatively few of
them are so suspended as to compensate for the
unequal strains of expansion and con-
traction; and in nearly every instance in
which they have exploded, subsequent in-
vestigation has traced the disaster to causes
of weakness which could have been guarded
against by well known means. Intelligent
men no longer see anything more mysterious
in a boiler explosion than in the discharge of
a loaded gun. Public opinion has been alto-
gether too lax in holding steam users to their
responsibilities, and in accepting as final the
unsatisfactory verdicts of juries so confused
by conflicting testimony that they could
reach no conclusions. If a man whose boiler
exploded was required to take the conse-
quences, fewer accidents of this kind would
happen, and then only when the steam user
deliberately weighed the chances of gain or
loss, and took them with full knowledge of
the desperate game he was playing. It is
quite time we ceased to regard these boiler

explosions as mysterious happenings from
unexplained causes. Boilers never explode
when they are strong enough to carry the
pressure they are subjected to. This is a
platitude, of course, but it answers every
question which arises in connection with
accidents to steam boilers.

Consolidation of the Telegraph and Ocean Cable Companies.

Quickly following the reported consoli-
dation of the Western Union and American
Union Telegraph Companies, respectively
representing the Vanderbilt and Jay Gould
interests, together with the Atlantic and
Pacific, in which Mr. Gould is supposed to
have a controlling voice, comes the announce-
ment that the three great ocean cable
lines, under the Anglo-American, Direct, and
French Cables Companies, have likewise
combined, apparently expecting to main-
tain an absolute monopoly of the entire
transatlantic telegraph business. As re-
gards the land lines, it is tolerably cer-
tain that a plan is under consideration
which contemplates a consolidated capital
of \$80,000,000, each of the three parties con-
cerned resorting to a watering process for
this purpose. By this device, it is said,
they expect to launch their inflated stocks
on the community at large, and forever
after pocket their dividends on a fictitious
valuation. The measure as yet remains in
embryo, and the thought is suggested that a
collapse of the whole scheme may form a
part of the regular programme, when the
chief actors have "cleaned out the street"
through stock manipulations. With respect
to the ocean cable companies, there are
the same misgivings regarding the
good faith of all concerned. The French
company met in Paris on Wednesday,
and ratified the agreement previously
drawn up by a committee representing the
three companies, and on Friday meetings
were held in London by the two English
companies, the division of gross receipts
being arranged as follows from a common
pool: Anglo-American Company, 61 per
cent.; Direct Cable Company; 23 per cent.;
French Cable Company, 16 per cent.—the
several companies to pay *pro rata* for
working expenses, besides contributing a
share toward the construction fund, from
which to renew worn-out cables at the end
of their average life—say every ten years.

The question is widely discussed whether
the French company have not, by this act,
forfeited their charter, which is said to have
been granted on the express stipulation that
it should remain independent. Baron Cham-
boud, who represents the French Company
in New York, was directly interrogated on
this point, and he is reported as denying
that there was a consolidation, though he
acknowledged that there was "a working ar-
rangement." In reply to the question whether
there is not a provision in the French charter
promising independent competition, he said
that this was "a delicate question," which
he declined to answer. To the same effect was
a question put by a representative of *The Iron
Age* to Mr. Ward, representing the Direct
Cable Company, but this gentleman would
not admit there was a consolidation; and as
to the alleged agreement on the part of his
company stipulating for an independent exist-
ence, he thought that the correct view to
take was that any agreement with a former
Secretary of State could have no binding
force in law. He probably would not deny,
however, that it was within the rightful
powers of this government to order the
removal of any cable from American soil.

From all the facts obtainable, the infer-
ence seemed to be justified that, admitting
the existence of "a working arrangement,"
the several companies have not, strictly
speaking, combined. Each will maintain
its separate organization, and each will
endeavor to secure all the business possible.
As for any agreement beyond this, it may
be merely verbal, supported by no docu-
mentary proof. As remarked by a gentle-
man interested, when a possible interfer-
ence by the government was spoken of:
"How could the government show that
there was any agreement? The burden
of proof would be upon them. There
might be an agreement independent of
"any document."

The news fell upon the Produce, Cotton
and other commercial exchanges like the ex-
plosion of a torpedo, and immediately these
bodies united in earnest remonstrance. They
have done more than this, for they have
taken measures for the construction of in-
dependent lines of telegraph, seeing to it
that adequate capital is within reach for
this purpose. The Cotton Exchange is fore-
most in the opposition, and for the good re-
ason that its members find the telegraph tolls
the heaviest tax that falls on the cot-
ton trade. At the session on Monday,
President Tannaban in the chair, it was
stated that the object of the meeting was to
"start a new line." At this meeting a
committee were appointed to put themselves
in communication with the exchanges of
New York and the entire country, and seek
a method by which business men may be-
come independent of the monopoly. It was
shown that no less than four organizations
are in the field, with ample capital, ready
to enter upon the work of construction.
A company is in course of formation,
backed by men of great wealth, who
are ready to erect telegraphic wires within
sixty days in opposition to the Western
Union, if the scheme contemplated in the
resolutions of the Cotton Exchange is

carried out. The New York Land and
Ocean Telegraph Company, organized a year
ago, is likewise ready to engage in the
undertaking. It has secured the right to land
a cable anywhere on British territory; its
capital will be \$6,000,000, and it has partly
closed a contract for laying two cables of
phosphor-bronze, of guaranteed efficiency.
There is also the American Rapid Telegraph
Company, already established and working
under a new process. With sufficient en-
couragement, any one of these undertakings
could be pushed forward and made a formi-
dable competitor with the consolidated com-
panies. Probably the Produce and Mari-
time exchanges will take no action in the
matter.

Some of the leading iron making districts
of Great Britain have, according to the sta-
tistical returns just published, very materi-
ally increased their output in 1880, as com-
pared with 1879. The Cleveland district,
whose iron trade is now fifty years old, has
jumped from 1,781,443 tons in 1879 to
2,510,853 tons in 1880, thus overreaching
its best former year (1874) by a little
more than 500,000 tons, while the stock
has been little affected. The Scotch
furnaces have produced 1,049,000 tons,
against 932,000 tons in the year preceding
it, while stocks have in this case decreased
by a trifling amount. Together they make up
about one-half of the output of pig iron in
Great Britain, and it might therefore be in-
ferred from that data that a similar expan-
sion may be credited to the entire trade of
the country. While it is true that certain
districts, like that of Newcastle and the
Tyne, Lincolnshire and Cumberland, have
experienced a notable expansion, there are
many others which from present indi-
cations appear to have remained stationary,
or to have even receded. In the aggregate
these are important, so that it would not be
fair to draw conclusions from the record of
the two leading districts in reference to the
others. There are special reasons, too,
which have led to the remarkable expansion
of the production of the Cleveland district.
Hitherto an overwhelming proportion of the
pig made was smelted from local ores, and
the metal was used for the manufacture of
bar, angles, plates, &c. During the last
year, however, the establishment of a grow-
ing steel industry has led to large importa-
tions of pure ores for the manufacture of Bes-
semer pig, of which 550,000 tons were pro-
duced, against 300,000 tons in the preceding
year. Partially, this is equivalent to a trans-
fer of this industry from other districts to this
favored one; it does not, therefore, repre-
sent a net gain when the make of the whole
country is taken into account. It should
not be forgotten, also, when deductions are
drawn from the statistics submitted, that
the best year, 1879, is compared with the
tolerably prosperous period following it, and
that while the exports in 1880 have increased
in a greater proportion than the make,
there is, comparatively, a falling off in the
home demand. On the whole, therefore,
the figures should not be viewed with that
alarm which they might inspire at first sight.

The February meeting of the American
Institute of Mining Engineers, to be held in
Philadelphia, promises to be a memorable one
in many ways. Dr. C. B. Dudley will read
a paper on the relation of the chemical com-
position of steel rails to their physical
properties, in which, if we are not mistaken,
he will support the general conclusion
announced in his papers at the Lake
George meeting by an array of analyses and
service records which will at least give the
steel rail makers something to think about.
Dr. Dudley's investigations into the causes
of weakness and the conditions of durability
in steel rails are, without doubt, the most
thorough ever undertaken. He has had
practically unlimited opportunities. With
the whole Pennsylvania Railroad to furnish
him material, and official authority to
order any rail out of the track and into
his laboratory for chemical and physical
examination, he has certainly been able
to study his subject with unusual
thoroughness. He also has access to
exceptionally careful and exact track re-
cords, and can obtain the complete history of
every rail which comes under his notice, in-
cluding the tonnage which has passed over
it. He is, therefore, well qualified to dis-
cuss the subject, and his views should, and
unquestionably will, receive the careful con-
sideration of steel rail makers and railroad
engineers. This alone would give the meet-
ing more than ordinary interest; but it is
probable that many other papers of value will
be presented. The social features of the
meeting will also be more than ordinarily
agreeable. We hear already the busy hum
of preparation, and mysterious hints reach
us of surprises in store for the visiting mem-
bers. The local committee will undoubtedly
vindicate the traditional reputation of the
good people of Philadelphia for hospitality,
and those of the members who can attend
and do not will probably have occasion for
several different kinds of regret when they
hear about it.

Some census statistics of cotton manu-
facture in the United States, elsewhere
given in this issue, show a gratifying pro-
gress in this industry in the Southern
States. The fifteen Southern States have
16,386 looms and 792,138 spindles. These
consume annually 2,062 bales of cotton
and give employment to 23,068 operatives.
Georgia makes the best showing, having

4713 looms and 200,974 spindles, and Arkansas the poorest, with only 28 looms and 2015 spindles. South Carolina's number of looms—1776—suggests the independence the cotton-growing states may yet attain in the manufacture of the staple.

The recognized and frequently applauded tendency of modern investigation in natural sciences, has been toward an accumulation of facts, rather than toward any effort to generalize from them. As a reaction against the mania of speculation prevailing in the earlier stages of the development of modern chemistry, geology, &c., the direction taken has produced highly salutary results. The foundations thus laid have been broad and substantial, and the haze of doubt and uncertainty has been swept away in many departments of science, while new fields of research are constantly opening to a large number of intelligent and active workers. No one will be inclined to underrate the value of their labors, and yet it is difficult to escape the feeling that, notably in chemistry, this search for new facts is conducted without the proper discrimination. A mass of data is piled up without order or connection. It would be valuable material in the hands of those skilled in grouping and arranging it in such a manner as to secure a basis for further work. In its present shape, however, it is only raw material, and while a great deal of credit properly attaches to original investigation, it should be remembered that it is as great a thing to make a fact useful as to find it out.

WASHINGTON NOTES.

Cotton Ties—Mr. Morrill's Views on the Iron Outlook—Congress and Representation—The Duty on Zinc.

(From Our Own Correspondent.)

WASHINGTON, D. C., January 19, 1881.

During a recent visit of Daniel J. Morrill, that gentleman, with others interested in maintaining the present duty on hoop iron, had an interview with the Secretary of the Treasury on the recent decision of Judge French on cotton ties. The Secretary of the Treasury has just decided not to reopen this subject with a view to a hearing specifically on the cotton tie question. He declines to put the cotton ties named in the category of all other cotton ties no matter how constructed. He refers to the decision in the courts at New Orleans in the case of the cotton tie with a stud and buckle, and declines to include that in the provisions of the decision affecting hoop iron cut to lengths.

Mr. Morrill, during his visit here, spoke in very satisfactory terms of the condition and outlook of the iron industry. He said that fair remunerative prices prevailed for those who were well established in the business, and those establishments that never had much backing could not long continue in business. His opinions were that a steady paying rate was better than an unusually high price, as high prices always drew other concerns, tempted by large profits, into the business and thus injuriously affected the whole trade.

Congress, during the past week, has been very busy, but has accomplished very little work. It is a quite noticeable fact that neither Senators nor Representatives, Republicans nor Democrats, are much in the mood for work. They pass most of their time during the session sitting in the retiring rooms, smoking and discussing politics. They construct cabinets one day and take them apart the next, and reconstruct them the next with about equal authority for their conclusions. The only positive thing about the whole matter is that Blaine will be the premier of the new administration, and that Frye, in all probability, will succeed him in the Senate. The first is generally satisfactory to Republicans, and the latter is also, except that the tariff men were determined to place Frye in the Speaker's chair.

Among the other occupations of members of Congress just now, is mathematics as applied to ratio and representation. The general report of the census of population has now been submitted to Congress, and each member is figuring away to see how the different ratio will affect the interests of his own State and district. The number of Representatives urged by Mr. Cox is 301. Under this ratio Maine, Massachusetts, New Hampshire, Vermont, Pennsylvania, Ohio, Indiana, Tennessee and Florida will each lose one; New York will lose two. Arkansas, California, Iowa, Michigan, Mississippi, South Carolina, Wisconsin and West Virginia gain one each; Minnesota and Nebraska two each; Kansas three and Texas four.

According to this plan, the Northern States gain 11 and lose nine—a net gain of 2, and the Southern gain 8 and lose 2—a net gain of 6. The first representation under the Constitution was on a ratio of 30,000, and the total whole number 65 members. Under the last census the ratio was 131,425, and the number of Representatives 293, and under this it will be about 160,000. The increase at the South causes great surprise all around, and demonstrates how little the North has known of the development in that section of the country during the past 20 years. It was generally supposed that there would be a decided decrease as compared with the North, but the official figures show the reverse.

An appeal having been made from a decision assessing duty at the rate of 35 per cent. ad valorem on certain imported zinc prepared for engraving, under the head of manufacture of zinc, the appellant claiming that it should be classified as zinc in sheets at the duty of 2½ cents per pound, the department affirms the decision on the ground that the merchandise in question consists of grained and polished zinc plates, 30 by 20 inches, which have been prepared by being cast in molds and by having the edges beveled and the surface polished for a certain class of engraving work; that it is not the sheet zinc which is known to commerce as such, but an entirely different article, which at that port is classified as a manufacture of zinc at a duty of 35 per cent. ad valorem.

Spontaneous Combustion.

Many hundred fires remain unexplained, even after the most painstaking and exhaustive investigation. "Among all the wonderful phenomena which chemistry presents to us," writes Prof. Weissman, "there are few more remarkable than those of spontaneous combustion of bodies, animate and inanimate, which emit flames, and are sometimes entirely consumed by internal fire." Among the substances subject to spontaneous combustion pulverized charcoal is one of the most remarkable. "A load of charcoal was delivered in an outhouse of a clergyman in Leipzig, and showed no signs of taking fire until the door, by accident, was left open, when the wind blew sprinklings of snow on the charcoal. The rapid absorption of oxygen from the melting snow caused the charcoal to ignite, and, as the day was windy, the whole range of buildings was burned to ashes." In this connection a frightful and unsuspected source of fire suggests itself to those of our American housekeepers who burn wood as fuel, and who store the ashes in boxes or barrels. The accidental disturbing of such ashes, even after having been ignited by bits of charcoal and unconsumed woody fiber, provided the air is damp or foggy. The phosphorus of potash from decayed wood renders woody matter in ashes highly inflammable, and mysterious cellar fires in the rural districts are, no doubt, in some cases caused by this extraordinary form of spontaneous combustion.

Prof. Weissman himself had the unfortunate experience of being burned out of house and home on a wild winter night some three years since, and he has since diligently collected facts about it.

It appears that he had been having his house painted, and one night the painters, as their manner is, left their working pants, their pots and their brushes on the asphalt floor of the cellar. They had previously with a bunch of rags removed from their hands with spirits of turpentine the paint with which they were soiled. The ball of rags took fire, the pants and paint pots followed suit, and the house was burned to the ground.

In the carriage factory of Messrs. Eaton & Gilbert, Troy, N. Y., a drop of linseed oil fell into an open pan of blacklead, set it on fire and came within an ace of burning down the whole great factory.

In several instances oilcloth in large rolls has taken fire in damp, muggy weather. An instance of this also occurs in American fire experience. A planter in Virginia sent his servant to Fredericksburg for a roll of oilcloth. It was a warm day and the wagon was open. During the journey home it began to rain, and the roll of oilcloth took fire on the road. Another instance of the kind is supplied by Philadelphia during the war. An order from the War Department in Washington for knapsacks for a regiment was filled by a Philadelphia Contractor. The sacks were all finished and collected, and counted over and left in a pile in the paint shop about 10 o'clock on Saturday night so as to be sent to Washington by cars early on Monday morning. On entering the paint shop before daylight on Monday morning no knapsacks were to be found. In their place was nothing but a heap of smoldering ashes!

Newly pressed hay frequently ignites, as do also oatmeal and cornmeal in barrels. During the famine in Ireland in 1847-48 a vessel was dispatched from New York with a cargo of cornmeal for the relief of the sufferers. In discharging the bags from the vessel the last three were found to be on fire.

The American Journal of Science gives a remarkable instance of the spontaneous combustion of wood. A Mr. Reigart, two years previous to the occurrence, received a piece of wood, supposed to be cedar, detached from a large piece dug up 39 feet below the surface, near Lancaster, Penn. The piece weighed a few ounces, and it was broken in two and laid upon a white pine shelf in Mr. Reigart's counting-room. About four days before the discovery of the fire he had occasion to wipe the dust from the shelf and from the piece of cedar, with a wet cloth. Three days afterward it was discovered that the piece of wood had ignited, and combustion was proceeding so rapidly that in a few minutes the shelf would have been on fire. Probably another prolific source of our forest fires is to be sought in the liability of decayed wood, not only to spontaneous combustion, but from the direct rays of the sun. At Winchester, Conn., some years since, some workmen, about 2 p. m., on August 5, discovered smoke arising from a barren upland. The sun was excessively hot at the time. When they went to seek the origin of the smoke they found that the remains of an old decayed hemlock log had burst into a blaze, and were burning fiercely.

Prof. Weissman relates several well authenticated cases in which tubulous vessels, hyacinth glasses, wine decanters on shelves, by receiving the direct rays of the sun from an open window, have caused serious conflagrations. In the township of Boscawen, Merrimac Co., N. H., it is related a shelf was set on fire in a hotel by means of a pear-shaped decanter containing gin. Any other liquid would be, of course, equally dangerous if exposed to the sun.

"That animal bodies are liable to spontaneous combustion," says Prof. Weissman, "is a fact which was well-known to the ancients. Many cases have been adduced as examples, which were no doubt merely cases of individuals who were highly susceptible to strong electrical excitation." A certain gentleman, known to the Professor, on a cold, keen winter night, retired to his chilly sleeping room. He had worn silk stockings over his woolen ones during the day. On undressing for bed, as he drew off his silk stockings, he heard a sharp, crackling noise, but paid no special attention to it. In the morning, on looking for his stockings, he found them consumed to ashes, without having set fire to the chair on which they were laid. Still more wonderful and awful in the assurance that the wife of Dr. Treilias, physician to the late Archbishop of Toledo, Spain, emitted inflammable perspiration of such a nature that when the ribbon she wore was taken from her and exposed to the cold air it instantly took fire, and flashed with sparks of fire like a lively "Roman candle." And

Professor Hafmester, in the "Berlin Transactions," 1875, records a case of the same nature respecting a peasant, whose linen took fire, whether it was laid up in a box, when wet, or hung up in the open air. A case of this kind recently occurred at the abattoir in Jersey City. During the recent spell of hot weather one of the workmen threw off his blue linen blouse, smoking with perspiration. It was hung up in the ice house. In a few minutes it burst in a conflagration of sparks, and literally consumed itself.

Failures for the Year 1880.

The figures of failures for the entire country for each year as it is completed, afford the best indication of the condition of commerce that is furnished. The following compilation is made by the Mercantile Agency of Messrs. Dun, Wiman & Co. The figures for the year 1880 are exceedingly satisfactory, especially in comparison with those of preceding years, as the following will show:

Failures in the United States	No.	Liabilities.
In 1880.....	4,735	\$65,752,000
Failures in the United States	6,658	98,145,000
In 1879.....	10,478	234,381,000
Failures in the United States	8,872	199,669,000
In 1878.....	9,038	191,117,000
Failures in the United States	7,740	201,080,000
In 1877.....		

The above table indicates that the mercantile failures in the United States, during the year 1880, were in number 4735, with liabilities aggregating nearly \$66,000,000. The failures for 1879 were in number 6658, with liabilities of \$98,000,000. The decrease, therefore, for the past year, is 1923 in number, and in liabilities \$27,000,000—thus showing an improvement equal to 40 per cent. in number, and a saving in losses by bad debts in the same proportion. While the comparison of the last year with the previous one is so extremely favorable, the comparison of 1880 with 1878 is even more remarkable. In 1878 the failures numbered 10,478, while in 1880 they numbered only 4735, indicating a lessened number of casualties by 5743, equivalent to nearly 60 per cent. But in the amount of liabilities the change for the better is even greater, for in 1878 the indebtedness of those who failed was \$234,000,000.

The following table gives, in condensed shape, the geographical distribution of commercial casualties for last year. The comparison of failures to the number reported in business will repay a close examination, as perhaps indicating, more clearly than anything else, the localities in which the chances of success are greatest, and the sections in which the condition of trade has most rapidly improved. The gain is the most marked in the Western States, where only one person in every 235 traders failed, as compared with 1 in every 159 in 1879, while in 1878 it was 1 in every 70.

GEOGRAPHICAL DISTRIBUTION AND PERCENTAGE OF FAILURES.

States.	Number in business.	Number of failures.	Percentage of failures.	Amount of liabilities.	Average of liabilities.
Eastern.....	85,774	753	1 in 118	\$4,460,117	\$8,995
Middle.....	237,069	1,472	1 in 161	13,253,892	23,066
Southern.....	109,821	815	1 in 131	8,833,448	10,555
Western.....	275,672	1,171	1 in 235	11,519,419	9,837
Pacific.....	38,494	514	1 in 72	5,065,779	9,374
Total.....	746,833	4,735	1 in 158	65,752,000	\$13,886
Canada.....	57,103	907	1 in 63	7,988,077	\$8,807

The foregoing table of percentages affords a better idea than any other of the real decrease in the number of failures, apart from the amount of indebtedness. This will be understood by closely studying the foregoing figures as compared with the following, which extend the comparison back for some years. Thus, in 1876, every 66th man succumbed; in 1877, every 73d; in 1878, every 64th; in 1879, every 108th trader, while in 1880 it was only 1 in every 158 who laid down his load. In an army of nearly 750,000, an improvement so marked ought certainly to beget most hopeful confidence in its future chance of success, provided the requisite laws for the regulation and protection of such a host are forthcoming.

With regard to the comparisons contained in these figures, the circular goes on to say: "In the dark days which the trade of the country experienced between 1874 and 1879, the gloomy statistics which, by almost universal consent, it was our painful duty to compile, were regarded as the most unmistakable evidences of an unhealthy condition of the body politic. Now, however, that it is our pleasant task to compile figures of such a highly favorable character, the result should be regarded as a kind of concentrated testimony to the vastly improved condition of the community. For these failure statistics, be they favorable or unfavorable, may justly be regarded as the concrete result of the efforts yearly made by the vast number engaged in business pursuits, and indicate a healthy or a morbid condition of financial affairs as faithfully as the barometer does the state of the atmosphere. It is, therefore, with more than ordinary gratification that we submit the comparisons which these tables contain, confirming as they do the general conviction that the country is in a highly prosperous state; that the disturbing elements, so far as they affect trade and commerce, are exceedingly few, and that the prospect for the future is almost without a cloud, except such as might be created by departures from legitimate principles."

Notwithstanding this extremely promising state of affairs, there are some contingencies which even in times as prosperous as these should be looked for as almost certain to arise. The agency enumerates these as follows: "The rapidity of expansion, which is noticeable at present, is almost certain to result in speculations of a disastrous character. It should be borne in mind that within two years there has been an increase, from importation and home production, in the stock of precious metals in use, amounting to \$250,000,000. Most of this has been made

available as currency, and the consequence is that this sum has become an immense power toward inflation. This amount indicates an increase by one-third of the whole volume of the circulating medium as it stood at the date of the resumption of specie payments, and the result is already seen in the immense increase in the prices of stocks, and a very considerable advance in the values of staples. The speculative tendencies already developed by this increase in money facilities is shown in the remarkable statement that, during the year 1880, the amount of stocks sold on the New York Stock Exchange was 98,000,000 of shares, or nearly as much as the last two years combined, while in 1875 the shares sold numbered only 53,000,000. Another evidence of expansion may be noted in the magnitude of the exchanges recorded by the Clearing House in the city of New York for the first week of 1881. Deducting all the transactions arising from stock operations, the payments amounted to \$300,000,000 for a single week, showing the largest transactions of any week on record. The three indications above mentioned—the increase in money, the growth of stock operations, and the magnitude of exchanges—may be taken as evidences of a general condition which exists to a greater or less extent throughout the country. What the consequences of an expansion so marked will be, no one can foresee. Some, who are prone to desecrify at every turn, fear a sudden collapse even when the sky is clear, or, as Carlyle says, 'a bolt out of the blue'; while others who are equally well informed, and whose experience entitles them to credence, do not apprehend, so long as times are moderately prosperous, any disaster whatever. It is a fact, however, which may be pregnant with warning, that the failures in the last six days of the year 1880 have been not only numerous, but unusually important and significant. It is difficult to reconcile some of the recent disasters with the prosperous condition which is supposed to exist, though some of these failures may be accounted for by a departure from legitimate business principles, and by undertaking to attempt the control of the market for large products. Still, disasters are numerous, which seem almost unaccountable in the present prosperous condition of things. In this connection the recent events which have occurred in the Southern States call for attention. The casualties in the interior towns in that section have been very numerous and very startling, and jobbers and others who have large interests there are beginning to feel an apprehension which is hardly in consonance with the existing state of things elsewhere. The causes of the frequent failures in this direction are supposed to be overstocking in autumn, the bad weather which has pervaded a large area, and the slow delivery and realization of the cotton crop in consequence. In the West, Northwest, and in the Middle States, failures are not so numerous, but when they do occur, they are very significant in character, and very much calculated to disturb the happy frame of mind which the year under review has created."

The agency makes a very strong appeal for a National Bankrupt Law, which we cannot do better than insert as it is given: "There is one thing, however, which is more calculated to interfere with the prosperity of the trade of the country than any other, and that is the absence of some provision by which debtors and creditors can alike be protected, and which should take the shape of a national insolvent or bankrupt law. 'The race of the diligent,' as it is called, by which one creditor seeks to get the advantage of another, is an element almost fatally destructive of the credit of hundreds of traders; while the disposition of debtors themselves to protect their friends to the detriment of outside creditors, is destructive of the confidence essential to the existence of credit. The peculiar experience which, as mercantile agents, we are daily encountering, enables us to discover the gradual shriveling up of credit in hundreds of cases where, with confidence and the prospect of an equitable distribution of assets, disaster might be avoided. The slightest intimation of prospective trouble, whether well founded or not, in the condition of any trader, will cause almost every creditor to pounce upon him with all the terrors of the law, in the hope that one may get advantage over another; while to the trader himself, thus threatened with disaster, the temptation to make preferences to those who will most readily assist him in his time of trial is almost irresistible. The laws of the various States differ so seriously, and in certain quarters so much favor attachments and recovery by summary process, that it is almost difficult to conceive how the business of the country can go forward without the intervention of some national remedy, for which the Constitution in its wisdom provides, and which certainly, at the earliest possible moment, should be made available. We repeat that there is nothing at the present moment in the shape of law so urgently demanding enactment as a national bankrupt act, if the internal commerce of the country is to be conserved, and if the prosperity we now enjoy is to continue."

British and American Artisans.

Mr. Mark Pattison, the other day, in an address delivered at Saltire, in Yorkshire, pointed out the essential deficiencies of British industrial capacity. He showed how, and tried to explain why, the English skilled workman is inferior, on the one hand, to the American, and on the other to the French artizan.

At the outset of this address the speaker called attention to the energy and ingenuity exhibited in the north, as compared with the south of England. This fact is chiefly interesting to us from the explanation suggested. There is, of course, a difference of origin between the two sections, as there was a strong infusion of Danish blood in the counties north of the Roman road which bisected the island, and which came to be known as "Watling street." Mr. Pattison, however, seems to think that the relative stolidity of the southern industrial population is mainly due to another cause, namely, the drainage of vigor and capacity

which took place through the emigration to America in the first half of the seventeenth century. There is no doubt that the great mass of colonists were natives of middle and southern England, and that, although a considerable contingent was furnished by what were once Danish settlements in East Anglia and the "Five Boroughs," very few indeed came from Yorkshire and Lancashire, the present centers of British industry. Mr. Pattison thinks this Puritan exodus meant a loss of blood and brain to southern England comparable with that experienced by France through Huguenot emigration after the revocation of the Edict of Nantes. We do not agree with him in assigning such large effects to the emigration. There were enough Puritans left in England to carry through the great rebellion and establish the Commonwealth. They were always in a decided minority, however, and it is probable that the depletion of the best elements in their ranks, through the prolonged strain of civil war, is mainly chargeable with the collapse of their political system after the death of Cromwell, and the comparative exhaustion of the southern population ever since. It is none the less true and striking that in the American mechanic we see what the artizan of southern England might have been had the Puritan Commonwealth survived.

After praising the workman of Yorkshire and Lancashire, Mr. Pattison tells him plainly wherein he, and the American mechanic whom he most resembles, fall short of the French artizan. Of two elements which enter into the production of manufactured articles, namely, artistic design and mechanical ingenuity, the former is still possessed in a pre-eminent degree by the French as compared with the Anglo-Saxon race. We cannot expect to vie with them in this respect, because, says Mr. Pattison, our civilization is still young, and not yet permeated with artistic sensibilities. The subtlety of feeling and delicacy of hand requisite for goods whose value depends on style and fancy, imply a wide diffusion of good taste and hereditary aptitudes, as well as traditional processes, to provide the supply. In a word, says Mr. Pattison, the tasteless designs of the French pre-exist in their gracious manners; their polite usages and their elegant patterns are only different manifestations of the intense life of a sensitive and highly trained race in possession of an old tradition. What is here said of England is emphatically applicable to the United States. It is doubtless true that a young nation can hardly have fine manners or the daintiness of hand and eye generated by refinement of life.

When we pass from industrial products intended for ornament, or in which a pleasing appearance is, at least, one of the ends in view, to things meant for use, we see at a glance the scope and source of American superiority. In an old country there are not only inherited aptitudes and pervasive tastes, but also a surplus of labor and superabundance of time. In America, where a scarcity of skilled labor has, as a rule, prevailed, there is a strong stimulus applied to the originating power; a great premium offered for the invention of labor-saving machines and tools. Mr. Pattison cites from a report of the last Paris exhibition a comparison of other exhibits of machinery with the American which is highly favorable to the latter. Of the French in particular it was said that, in the manufacture of machine tools, they do not seem to have grasped the leading principles of mechanics with sufficient thoroughness and insight to be capable of originating new forms and combinations. It was very different, we are told, in the American section, where novel arrangements of motion had given rise to new forms of framing, and where the demands have all the freshness of being struck from first principles. Mr. Pattison admits, too, that it is not merely in machines by which labor is economized that American intellectual fertility showed itself. This, of course, is demonstrated by our recent achievements in watchmaking, as well as by our earlier inventions of the revolver and the repeating rifle.

Now, the English artizan was not always behind the American workman in respect of inventive skill. Time was, Mr. Pattison reminds us, when all the new discoveries in practical science, and improvements in machinery and engineering, were first made in England; whereas now it is from America that all the new inventions come. It was natural enough that we should lag behind our English kinsmen in the colonial epoch, when we had, so to speak, no manufactures. But Mr. Pattison will find, we think, that the awakening of American inventive fertility responded promptly to the call for it; that it was contemporaneous in fact, with the first development of American industries on a large scale.

But what is the specific force that stimulates an American mechanic to invent the innumerable things as to which the necessity of saving labor could not be immediately felt? What is it that quickens his faculties, but does not operate in the case of the Lancashire or Yorkshire workman? There were only, it seems, 5,000 patents taken out last year in England, against about 12,000 granted in the United States. Mr. Pattison thinks one cause of the discrepancy is the greater expense involved in securing a patent right in England. We should scarcely stress up this circumstance, from the fact that the cost of a patent is much less frequently borne by the inventor himself than by capitalists who promote the introduction of the invention. The fundamental question is, why is capital so slow in England and so prompt in America to encourage mechanical ingenuity? Because, compared with our own, England is an old country, clinging to routine and custom, which contribute to its thinking the accumulated wisdom of past generations. A country where nothing new can be made popular without an agitation and a clamor not at all proportionate to the object to be gained. Therefore, when British capital invested in industry had to depend almost exclusively on native resources, it was willing to risk more. But now it is safer and cheaper to seek and see a patent issued in America before undertaking the expensive and unceremonious task of recommending innovations to the British public.

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AND
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Metal Prices.

There is a movement in Germany against the present methods of teaching in the higher technical schools. Manufacturers, and those in charge of great railway and industrial enterprises, complain that the graduates, who are crammed with scientific information, lack any correct appreciation of practical questions. While conceding the importance of studies of a higher order, they protest against the waste of time which too much devotion to them entails. They urge that, although forming a valuable basis for the solution of complex problems, the utility of these studies is overrated, and they attribute this fact to the circumstance that many of the professors have other jobs

all their connection with practical work, or have not during their career had any experience whatever. In the beginning of the development of the present system of technical education, eminent men from the ranks of the profession were chosen to assume the duties of instructors. Now young men of talent are, after graduation, appointed assistants and adjunct professors, and in time take the place of their predecessors, without ever having had any full insight into the actual practical requirements of the professions, for which they are expected to prepare their students. The ambition of this rising generation of scientific gentlemen appears to be for elaborate mathematical treatises, for which the world is no doubt much indebted to them. But they err seriously when they assume it to be their duty to make such works the text books for their respective colleges. A training in higher mathematics is undoubtedly of much value to a mechanical or civil engineer, but we do not hesitate to express the opinion that less than five per cent. of the graduates of colleges have ever in after life made direct use of calculus, for instance. In Germany, where the teaching of abstract science has been carried to excess in colleges, a reaction is now setting in. In this country we are far from that danger yet, but still there are indications of a tendency in that direction, which we trust the good common sense and business tact of the trustees of our colleges will check ere it becomes menacing to their utility.

Liability of Employers for Accidents.

Another case of considerable interest in respect to the liability of employers for injury to workmen, has just been decided by the Supreme Court of Pennsylvania. It is the case of *Bedell against the National Tube Works*, and is very similar to the case against the Keystone Bridge Company which we have already commented upon. As in that case, the lower court gave judgment against the company and the Supreme Court reverses the decision.

The facts of the case are these: The company had leased a rolling mill which was out of repair. The general superintendent and manager of the company was Mr. Jackson, and Mr. Eardly was a millwright and machinist under daily pay, and had been for some time in the employ of the company. Jackson sent Eardly to take charge of the work in repairing, and, as an inducement to its more speedy completion, was to pay him an extra sum of \$50 therefor. A part of the repairs required was the adjustment of a fly-wheel and the putting of a heavy beam on each wall of the pit in which the wheel was to revolve. The larger timber had been raised and put in place by means of a rope and chain tackle and crane, worked by a windlass. The same machinery was used in raising the shorter timber. Bedell was a carpenter. He was employed by Eardly and directed by him, but paid by the company. He and one other were stationed at the higher end of the timber, for the purpose of screwing nuts on the ends of the bolts when they passed sufficiently through the timber. While the lower end of the timber was being slowly raised, Bedell thought to expedite it by pressing down the upper end. With this view he threw a jack-screw on the end of the timber, rested one hand on the top of the timber, and with the other picked up a block to put on the screw. Just at that moment the hook of the chain broke, the lower end of the timber fell and the upper end flew up, crushing his hand between it and the block on which the cylinder plate rested.

The court, in passing upon the appeal, states that the action was based on a tort. It rests on the alleged negligence of the company. The burden of proof was on the defendant in error to establish the negligence. We quote as follows:

There is no evidence that the company had any notice that Eardly was not a careful and competent person to perform the work to which he was assigned, nor do we find any showing that, in fact, he was not careful and competent. It therefore follows that the company was not guilty of negligence in putting him in charge of the work. The general superintendent did not direct in what manner nor with what appliances the timber should be raised. The company had other chains and of a larger size than the one used. Eardly selected one which he thought suitable. He testified that he made an examination of "every link and ring and hook" of the chain. The body of the chain was about nine-sixteenths of an inch. The hook was one and one-eighth inches in diameter. The witnesses for Bedell testified that the chain was rusty, and that Eardly was told that it was too weak for the purpose. Both of these facts were denied by the witnesses of the plaintiff in error. No witness swears that any doubt was expressed as to the sufficient strength of the hook but it was to the chain generally. It was the hook only that broke, although it was twice as large as the other part of the chain. The smaller part stood the test and showed no failure of strength. The evidence is that the timber weighed less than four tons. About one-third of it rested on the wall, so that only two-thirds of its weight was to be raised by the tackle. The hook exhibited no flaw, and in the opinion of experts its tensile strength was such that it ought to have stood a strain of 60,000 pounds, or 30 tons. This is fully ten times the weight of the part of the timber raised by the tackle. Thus, it appears, no one is to doubt, nor had any reason to doubt, that the strength of the hook was sufficient for the purpose to which it was applied. Eardly and Bedell were co-laborers in the work. They were fellow servants in the same common employment. Although Eardly was permitted to select some of the men who were to assist in doing the work, yet he, as well as they and all engaged therein, was hired by the day and paid by the company.

The court laid down the law of liability as follows:

A master is not liable to his servant for the negligence of a fellow servant while engaged in the same common employment. (Sherman & Redfield

on Negligence, page 85.) The master does not warrant the competency of any of his servants to the other. It matters not that they are of unequal grade, if the services of each in his particular labor is directed to the same general end. And, although the inferior in grade is subject to the control and directions of the superior, whose act caused the injury, the rule is the same. *Whar. Law of Neg.*, sec. 229; *Lehigh Valley Coal Co. vs. Jones*, 5 Norris, 432; *Priestley vs. Fowler*, 3 Mee & W., 6; *Wonder vs. B. & O. R. R.*, 38 Md., 410. If, then, we have shown that Eardly and Bedell were fellow servants, even if the former were negligent on the occasion of this injury, that fact is insufficient to charge the company with negligence in appointing the negligent employee. *Whar. on Neg.*, sec. 240; *Feltham vs. England*, L. R., 2; Q. B., 33.

These two cases appear to have settled, for the State of Pennsylvania at least, the points laid down in the opinions of the Supreme Court; but the especial point of both decisions is that an employer is not liable for injury done an employee, even though the employee may have been working under the direction of another, unless it is shown that the one under whose direction he was working was a direct representative of the employer, and unless he proceeded under the direct orders of the employer to do the act that caused the injury. Where the one having charge of the work, not being a direct representative of the employer, acts in his own best judgment, and through an error of judgment some injury follows, the employer is not responsible, unless he knew that the man in charge was unskillful or incompetent.

Boiler Explosions in Iron Works.

In a letter to the Editor of *The Iron Age*, discussing the recent frequency of boiler explosions in iron works, Mr. J. W. Allen, president of the Hartford Steam Boiler Inspection and Insurance Company, states that the observations and experiences of his company lead to the conclusion that the cause is largely carelessness. The rush of business has brought many boilers into use which for years have been idle, and they have been put to what would be their full capacity in perfect condition. This conclusion seems to be warranted in the case of the recent explosion at Allentown, although the Hartford Company have not yet obtained enough information on the subject to warrant them in expressing any opinion in this particular case. Mr. W. W. Williams, president of the Keystone Council No. 1, of the Stationary Engineers of Philadelphia, has made a report on the Allentown case which, if justified by the facts, makes an unpleasant showing. He says:

In the first place, I find malconstruction. The malconstruction was in hanging the boiler at the extreme ends and the cutting of the hole in the shell the full size of the dome; also in having the fourth sheet 16-inch iron, and the fifth sheet 16-inch iron. The bad workmanship I find in the riveting, the holes not being even, and the rivets being too small for the holes—the holes 1/4-inch and the rivets 3/8-inch. From the evidence it appears that the pressure has been carried far in excess for a boiler of this size and thickness, as we estimate the strength of a boiler by its weakest part. I would judge the character of the iron, as it presents itself, able to sustain a tensile strength of 50,000 pounds per square inch, and reducing this 44 per cent., and taking the thickness of the iron at 5/16, and the diameter of the boiler at 35 inches, the bursting pressure would be 253½ pounds. One-sixth of the bursting pressure being the safe working pressure (by our city ordinance) the safe working pressure would be 42½ pounds. This would be the safe pressure for the iron that gave way, the fourth sheet, while the fifth sheet—being 3/8 iron—by the same rule it would have a bursting pressure of 66½ pounds, and a safe working pressure 11.1 pounds. This would be the calculation for a new boiler of first-class workmanship, and hanging from three saddles distributing the weight. Now, when we consider the weight of the boiler at 6000 pounds, and a weight of 8000 pounds of water, and of 5000 pounds of brick and mortar laid on top of the boiler, there is not much wonder that it gave way in the center, particularly when assisted by at least 90 pounds per square inch on the head of the boiler, which would be the mean between 60 and 120. This would be equal to a force of 91,608 pounds on the heads tending to pull the boiler apart in its curvilinear seam. In its full strength, admitting it to be equal to 50,000 pounds per square inch, and reducing it 44 per cent., for riveting, its tensile strain would be 27,820, and one-sixth of this would be a safe load for it to bear. This is 177,186 pounds, and subtracting the pressure on the heads (91,608) would leave us 79,778 as a surplus to support the weight of the boiler, weight of water and weight of brickwork, which would be 10,000 pounds. There is not much wonder that the boiler gave way in the center, which, theoretically and practically, is the weakest point when the boiler is hung from the ends and there is no support for the center. The boiler should, undoubtedly, have been constructed before the last patch was put on. It was evidently a great deal older than reported.

The subject of supporting boilers in puddling and heating furnaces and in other positions around iron and steel works, is one which should receive a much more careful and intelligent study from mechanical engineers than they have yet considered it necessary to give it. Comparatively few of them are so suspended as to compensate for the unequal strains of expansion and contraction; and in nearly every instance in which they have exploded, subsequent investigation has traced the disaster to causes of weakness which could have been guarded against by well known means. Intelligent men no longer see anything more mysterious in a boiler explosion than in the discharge of a loaded gun. Public opinion has been altogether too lax in holding steam users to their responsibilities, and in accepting as final the unsatisfactory verdicts of juries so confused by conflicting testimony that they could reach no conclusions. If a man whose boiler exploded was required to take the consequences, fewer accidents of this kind would happen, and then only when the steam user deliberately weighed the chances of gain or loss, and took them with full knowledge of the desperate game he was playing. It is quite time we ceased to regard these boiler

explosions as mysterious happenings from unexplained causes. Boilers never explode when they are strong enough to carry the pressure they are subjected to. This is a platitude, of course, but it answers every question which arises in connection with accidents to steam boilers.

Consolidation of the Telegraph and Ocean Cable Companies.

Quickly following the reported consolidation of the Western Union and American Union Telegraph Companies, respectively representing the Vanderbilt and Jay Gould interests, together with the Atlantic and Pacific, in which Mr. Gould is supposed to have a controlling voice, comes the announcement that the three great ocean cable lines, under the Anglo-American, Direct, and French Cables Companies, have likewise combined, apparently expecting to maintain an absolute monopoly of the entire transatlantic telegraph business. As regards the land lines, it is tolerably certain that a plan is under consideration which contemplates a consolidated capital of \$80,000,000, each of the three parties concerned resorting to a watering process for this purpose. By this device, it is said, they expect to launch their inflated stocks on the community at large, and forever after pocket their dividends on a fictitious valuation. The measure as yet remains in embryo, and the thought is suggested that a collapse of the whole scheme may form a part of the regular programme, when the chief actors have "cleaned out the street" through stock manipulations. With respect to the ocean cable companies, there are the same misgivings regarding the good faith of all concerned. The French company met in Paris on Wednesday, and ratified the agreement previously drawn up by a committee representing the three companies, and on Friday meetings were held in London by the two English companies, the division of gross receipts being arranged as follows from a common pool: Anglo-American Company, 61 per cent.; Direct Cable Company, 23 per cent.; French Cable Company, 16 per cent.—the several companies to pay *pro rata* for working expenses, besides contributing a share toward the construction fund, from which to renew worn-out cables at the end of their average life—say every ten years.

The question is widely discussed whether the French company have not, by this act, forfeited their charter, which is said to have been granted on the express stipulation that it should remain independent. Baron Chambord, who represents the French Company in New York, was directly interrogated on this point, and he is reported as denying that there was a consolidation, though he acknowledged that there was "a working arrangement." In reply to the question whether there is not a provision in the French charter promising independent competition, he said that this was "a delicate question," which he declined to answer. To the same effect was a question put by a representative of *The Iron Age* to Mr. Ward, representing the Direct Cable Company, but this gentleman would not admit there was a consolidation; and as to the alleged agreement on the part of his company stipulating for an independent existence, he thought that the correct view to take was that any agreement with a former Secretary of State could have no binding force in law. He probably would not deny, however, that it was within the rightful powers of this government to order the removal of any cable from American soil.

From all the facts obtainable, the inference seemed to be justified that, admitting the existence of "a working arrangement," the several companies have not, strictly speaking, combined. Each will maintain its separate organization, and each will endeavor to secure all the business possible. As for any agreement beyond this, it may be merely verbal, supported by no documentary proof. As remarked by a gentleman interested, when a possible interference by the government was spoken of: "How could the government show that there was any agreement? The burden of proof would be upon them. There might be an agreement independent of 'any document.'"

The news fell upon the Produce, Cotton and other commercial exchanges like the explosion of a torpedo, and immediately these bodies united in earnest remonstrance. They have done more than this, for they have taken measures for the construction of independent lines of telegraph, seeing to it that adequate capital is within reach for this purpose. The Cotton Exchange is foremost in the opposition, and for the good reason that its members find the telegraph tolls the heaviest tax that falls on the cotton trade. At the session on Monday, President Tannaban in the chair, it was stated that the object of the meeting was to "start a new line." At this meeting a committee were appointed to put themselves in communication with the exchanges of New York and the entire country, and seek a method by which business men may become independent of the monopoly. It was shown that no less than four organizations are in the field, with ample capital, ready to enter upon the work of construction. A company is in course of formation, backed by men of great wealth, who are ready to erect telegraphic wires within sixty days in opposition to the Western Union, if the scheme contemplated in the resolutions of the Cotton Exchange is

carried out. The New York Land and Ocean Telegraph Company, organized a year ago, is likewise ready to engage in the undertaking. It has secured the right to land a cable anywhere on British territory; its capital will be \$6,000,000, and it has partly closed a contract for laying two cables of phosphor-bronze, of guaranteed efficiency. There is also the American Rapid Telegraph Company, already established and working under a new process. With sufficient encouragement, any one of these undertakings could be pushed forward and made a formidable competitor with the consolidated companies. Probably the Produce and Maritime exchanges will take no action in the matter.

Some of the leading iron-making districts of Great Britain have, according to the statistical returns just published, very materially increased their output in 1880, as compared with 1879. The Cleveland district, whose iron trade is now fifty years old, has jumped from 1,781,443 tons in 1879 to 2,510,853 tons in 1880, thus overreaching its best former year (1874) by a little more than 500,000 tons, while the stock has been little affected. The Scotch furnaces have produced 1,049,000 tons, against 932,000 tons in the year preceding it, while stocks have in this case decreased by a trifling amount. Together they make up about one-half of the output of pig iron in Great Britain, and it might therefore be inferred from that data that a similar expansion may be credited to the entire trade of the country. While it is true that certain districts, like that of Newcastle and the Tyne, Lincolnshire and Cumberland, have experienced a notable expansion, there are many others which from present indications appear to have remained stationary, or to have even receded. In the aggregate these are important, so that it would not be fair to draw conclusions from the record of the two leading districts in reference to the others. There are special reasons, too, which have led to the remarkable expansion of the production of the Cleveland district. Hitherto an overwhelming proportion of the pig made was smelted from local ores, and the metal was used for the manufacture of bar, angles, plates, &c. During the last year, however, the establishment of a growing steel industry has led to large imports of pure ores for the manufacture of Bessemer pig, of which 550,000 tons were produced, against 300,000 tons in the preceding year. Partially, this is equivalent to a transfer of this industry from other districts to this favored one; it does not, therefore, represent a net gain when the make of the whole country is taken into account. It should not be forgotten, also, when deductions are drawn from the statistics submitted, that the best year, 1879, is compared with the tolerably prosperous period following it, and that while the exports in 1880 have increased in a greater proportion than the make, there is, comparatively, a falling off in the home demand. On the whole, therefore, the figures should not be viewed with that alarm which they might inspire at first sight.

The February meeting of the American Institute of Mining Engineers, to be held in Philadelphia, promises to be a memorable one in many ways. Dr. C. B. Dudley will read a paper on the relation of the chemical composition of steel rails to their physical properties, in which, if we are not mistaken, he will support the general conclusion announced in his papers at the Lake George meeting by an array of analyses and service records which will at least give the steel rail makers something to think about. Dr. Dudley's investigations into the causes of weakness and the conditions of durability in steel rails are, without doubt, the most thorough ever undertaken. He has had practically unlimited opportunities. With the whole Pennsylvania Railroad to furnish him material, and official authority to order any rail out of the track and into his laboratory for chemical and physical examination, he has certainly been able to study his subject with unusual thoroughness. He also has access to exceptionally careful and exact track records, and can obtain the complete history of every rail which comes under his notice, including the tonnage which has passed over it. He is, therefore, well qualified to discuss the subject, and his views should, and unquestionably will, receive the careful consideration of steel rail makers and railroad engineers. This alone would give the meeting more than ordinary interest; but it is probable that many other papers of value will be presented. The social features of the meeting will also be more than ordinarily agreeable. We hear already the busy hum of preparation, and mysterious hints reach us of surprises in store for the visiting members. The local committee will undoubtedly vindicate the traditional reputation of the good people of Philadelphia for hospitality, and those of the members who can attend and do not will probably have occasion for several different kinds of regret when they hear about it.

Some census statistics of cotton manufacture in the United States, elsewhere given in this issue, show a gratifying progress in this industry in the Southern States. The fifteen Southern States have 16,386 looms and 792,138 spindles. These consume annually 2,063 bales of cotton and give employment to 23,063 operatives. Georgia makes the best showing, having

4713 looms and 200,974 spindles, and Arkansas the poorest, with only 28 looms and 2015 spindles. South Carolina's number of looms—1776—suggests the independence the cotton-growing states may yet attain in the manufacture of the staple.

The recognized and frequently applauded tendency of modern investigation in natural sciences, has been toward an accumulation of facts, rather than toward any effort to generalize from them. As a reaction against the mania of speculation prevailing in the earlier stages of the development of modern chemistry, geology, &c., the direction taken has produced highly salutary results. The foundations thus laid have been broad and substantial, and the haze of doubt and uncertainty has been swept away in many departments of science, while new fields of research are constantly opening to a large number of intelligent and active workers. No one will be inclined to underrate the value of their labors, and yet it is difficult to escape the feeling that, notably in chemistry, this search for new facts is conducted without the proper discrimination. A mass of data is piled up without order or connection. It would be valuable material in the hands of those skilled in grouping and arranging it in such a manner as to secure a basis for further work. In its present shape, however, it is only raw material, and while a great deal of credit properly attaches to original investigation, it should be remembered that it is as great a thing to make a fact useful as to find it out.

WASHINGTON NOTES.

Cotton Ties—Mr. Morrell's Views on the Iron Outlook—Congress and Representation—The Duty on Zinc.

(From Our Own Correspondent.)

WASHINGTON, D. C., January 19, 1881.

During a recent visit of Daniel J. Morrell, that gentleman, with others interested in maintaining the present duty on hoop iron, had an interview with the Secretary of the Treasury on the recent decision of Judge French on cotton ties. The Secretary of the Treasury has just decided not to reopen this subject with a view to a hearing specifically on the cotton tie question. He declines to put the cotton ties named in the category of all other cotton ties no matter how constructed. He refers to the decision in the courts at New Orleans in the case of the cotton tie with a stud and buckle, and declines to include that in the provisions of the decision affecting hoop iron cut to lengths.

Mr. Morrell, during his visit here, spoke in very satisfactory terms of the condition and outlook of the iron industry. He said that fair remunerative prices prevailed for those who were well established in the business, and those establishments that never had much backing could not long continue in business. His opinions were that a steady paying rate was better than unnaturally high prices, as high prices always drew other concerns, tempted by large profits, into the business and thus injuriously affected the whole trade.

Congress, during the past week, has been very busy, but has accomplished very little work. It is a quite noticeable fact that neither Senators nor Representatives, Republicans nor Democrats, are much in the mood for work. They pass most of their time during the session sitting in the retiring rooms, smoking and discussing politics. They construct cabinets one day and take them apart the next, and reconstruct them the next with about equal authority for their conclusions. The only positive thing about the whole matter is that Blaine will be the premier of the new administration, and that Frye, in all probability, will succeed him in the Senate. The first is generally satisfactory to Republicans, and the latter is also, except that the tariff men were determined to place Frye in the Speaker's chair.

Among the other occupations of members of Congress just now, is mathematics as applied to ratio and representation. The general report of the census of population has now been submitted to Congress, and each member is figuring away to see how the different ratio will affect the interests of his own State and district. The number of Representatives urged by Mr. Cox is 301. Under this ratio Maine, Massachusetts, New Hampshire, Vermont, Pennsylvania, Ohio, Indiana, Tennessee and Florida will each lose one; New York will lose two. Arkansas, California, Iowa, Michigan, Mississippi, South Carolina, Wisconsin and West Virginia gain one each; Minnesota and Nebraska two each; Kansas three and Texas four.

According to this plan, the Northern States gain 11 and lose nine—a net gain of 2, and the Southern gain 8 and lose 2—a net gain of 6. The first representation under the Constitution was on a ratio of 30,000, and the total whole number 65 members. Under the last census the ratio was 131,425, and the number of Representatives 293, and under this it will be about 160,000. The increase at the South causes great surprise all around, and demonstrates how little the North has known of the development in that section of the country during the past 10 years. It was generally supposed that there would be a decided decrease as compared with the North, but the official figures show the reverse.

An appeal having been made from a decision assessing duty at the rate of 35 per cent. ad valorem on certain imported zinc prepared for engraving, under the head of manufacture of zinc, the appellant claiming that it should be classified as zinc in sheets at the duty of 2½ cents per pound, the department affirms the decision on the ground that the merchandise in question consists of grained and polished zinc plates, 30 by 20 inches, which have been prepared by being cast in molds and by having the edges beveled and the surface polished for a certain class of engraving work; that it is not the sheet zinc which is known to commerce as such, but an entirely different article, which at that port is classified as a manufacture of zinc at a duty of 35 per cent. ad valorem.

Spontaneous Combustion.

Many hundred fires remain unexplained, even after the most painstaking and exhaustive investigation. "Among all the wonderful phenomena which chemistry presents to us," writes Prof. Weissman, "there are few more remarkable than those of spontaneous combustion of bodies, animate and inanimate, which emit flames, and are sometimes entirely consumed by internal fire." Among the substances subject to spontaneous combustion pulverized charcoal is one of the most remarkable. "A load of charcoal was delivered in an outhouse of a clergyman in Leipzig, and showed no signs of taking fire until the door, by accident, was left open, when the wind blew sprinklings of snow on the charcoal. The rapid absorption of oxygen from the melting snow caused the charcoal to ignite, and, as the day was windy, the whole range of buildings was burned to ashes." In this connection a frightful and unsuspected source of fire suggests itself to those of our American housekeepers who burn wood as fuel, and who store the ashes in boxes or barrels. The accidental disturbing of such ashes, even after years, will ignite bits of charcoal and unconsumed woody fiber, provided the air is damp or foggy. The phosphuretted of potash from decayed wood renders woody matter in ashes highly inflammable, and mysterious cellar fires in the rural districts are, no doubt, in some cases caused by this extraordinary form of spontaneous combustion.

Prof. Weissman himself had the unfortunate experience of being burned out of house and home on a wild winter night some three years since, and he has since diligently collected facts about it.

It appears that he had been having his house painted, and one night the painters, as their manner is, left their working pants, their pots and their brushes on the asphaltum floor of the cellar. They had previously with a bunch of rags removed from their hands with spirits of turpentine the paint with which they were soiled. The ball of rags took fire, the pants and paint pots followed suit, and the house was burned to the ground.

In the carriage factory of Messrs. Eaton & Gilbert, Troy, N. Y., a drop of linseed oil fell into an open paper of lampblack, set it on fire and came within an ace of burning down the whole great factory.

In several instances oilcloth in large rolls has taken fire in damp, muggy weather. An instance of this also occurs in American fire experience. A planter in Virginia sent his servant to Fredericksburg for a roll of oilcloth. It was a warm day and the wagon was open. During the journey home it began to rain, and the roll of oilcloth took fire on the road. Another instance of the kind is supplied by Philadelphia during the war. An order from the War Department in Washington for knapsacks for a regiment was filled by a Philadelphia Contractor. The sacks were all finished and collected, and counted over and left in a pile in the paint shop about 10 o'clock on Saturday night so as to be sent to Washington by cars early on Monday morning. On entering the paint shop before daylight on Monday morning no knapsacks were to be found. In their place was nothing but a heap of smoldering ashes!

Newly pressed hay frequently ignites, as do also oatmeal and cornmeal in barrels. During the famine in Ireland in 1847-48 a vessel was dispatched from New York with a cargo of cornmeal for the relief of the sufferers. In discharging the bags from the vessel the last three were found to be on fire. The *American Journal of Science* gives a remarkable instance of the spontaneous combustion of wood. A Mr. Reigart, two years previous to the occurrence, received a piece of wood, supposed to be cedar, detached from a large piece dug up 39 feet below the surface, near Lancaster, Penn. The piece weighed a few ounces, and it was broken in two and laid upon a white pine shelf in Mr. Reigart's counting-room. About four days before the discovery of the fire he had occasion to wipe the dust from the shelf and from the piece of cedar, with a wet cloth. Three days afterward it was discovered that the piece of wood had ignited, and combustion was proceeding so rapidly that in a few minutes the shelf would have been on fire. Probably another prolific source of our forest fires is to be sought in the liability of decayed wood, not only to spontaneous combustion, but from the direct rays of the sun. At Winchester, Conn., some years since, some workmen, about 2 p. m., on August 5, discovered smoke arising from a barren mound. The sun was excessively hot at the time. When they went to seek the origin of the smoke they found that the remains of an old decayed hemlock log had burst into a blaze, and were burning fiercely.

Prof. Weissman relates several well authenticated cases in which tubulous vessels, hyacinth glasses, wine decanters on shelves, by receiving the direct rays of the sun from an open window, have caused serious conflagrations. In the township of Boscawen, Merrimac Co., N. H., it is related a shelf was set on fire in a hotel by means of a pear-shaped decanter containing gin. Any other liquid would be, of course, equally dangerous if exposed to the sun.

"That animal bodies are liable to spontaneous combustion," says Prof. Weissman, "is a fact which was well-known to the ancients. Many cases have been adduced as examples, which were no doubt merely cases of individuals who were highly susceptible to strong electrical excitation." A certain gentleman, known to the Professor, on a cold, keen winter night, retired to his chilly sleeping room. He had worn silk stockings over his woolen ones during the day. On undressing for bed, as he drew off his silk stockings, he heard a sharp, crackling noise, but paid no special attention to it. In the morning, on looking for his stockings, he found them consumed to ashes, without having set fire to the chair on which they were laid. Still more wonderful and awful in the assurance that the wife of Dr. Trellis, physician to the late Archbishop of Toledo, Spain, emitted inflammable perspiration of such a nature that when the ribbon she wore was taken from her and exposed to the cold air it instantly took fire, and flashed with sparks of fire like a lively "Roman candle." And

Professor Haffmester, in the "Berlin Transactions," 1875, records a case of the same nature respecting a peasant, whose linen took fire, whether it was laid up in a box, when wet, or hung up in the open air. A case of this kind recently occurred at an abattoir in Jersey City. During the recent spell of hot weather one of the workmen threw off his blue linen blouse, smoking with perspiration. It was hung up in the ice house. In a few minutes it burst in a conflagration of sparks, and literally consumed itself.

Failures for the Year 1880.

The figures of failures for the entire country for each year as it is completed, afford the best indication of the condition of commerce that is furnished. The following compilation is made by the Mercantile Agency of Messrs. Dun, Wiman & Co. The figures for the year 1880 are exceedingly satisfactory, especially in comparison with those of preceding years, as the following will show:

Failures in the United States	No.	Liabilities.
In 1880.....	4,733	\$65,752,000
Failures in the United States		
In 1879.....	6,658	\$8,149,000
Failures in the United States		
In 1878.....	10,478	\$24,383,000
Failures in the United States		
In 1877.....	8,872	\$9,569,000
Failures in the United States		
In 1876.....	9,032	\$9,117,000
Failures in the United States		
In 1875.....	7,740	\$9,080,000

The above table indicates that the mercantile failures in the United States, during the year 1880, were in number 4733, with liabilities aggregating nearly \$66,000,000. The failures for 1879 were in number 6650, with liabilities of \$8,149,000. The decrease, therefore, for the past year, is 1917 in number, and in liabilities \$27,000,000—thus showing an improvement equal to 40 per cent. in number, and a saving in losses by bad debts in the same proportion. While the comparison of the last year with the previous one is so extremely favorable, the comparison of 1880 with 1878 is even more remarkable. In 1878 the failures numbered 10,478, while in 1880 they numbered only 4733, indicating a lessened number of casualties by 5743, equivalent to nearly 60 per cent. But in the amount of liabilities the change for the better is even greater, for in 1878 the indebtedness of those who failed was \$24,383,000.

The following table gives, in condensed shape, the geographical distribution of commercial casualties for last year. The comparison of failures to the number reported in business will repay a close examination, as perhaps indicating, more clearly than anything else, the localities in which the chances of success are greatest, and the sections in which the condition of trade has most rapidly improved. The gain is most marked in the Western States, where only one person in every 235 traders failed, as compared with 1 in every 159 in 1879, while in 1878 it was 1 in every 70.

GEOGRAPHICAL DISTRIBUTION AND PERCENTAGE OF FAILURES.

States.	Number in business.	Number of failures.	Percentage of failures.	Amount of liabilities.	Average of liabilities.
Eastern.....	85,774	733	1 in 118	\$6,460,117	\$8,035
Middle.....	237,064	1,472	1 in 161	\$3,953,893	\$2,686
Southern.....	109,821	815	1 in 134	\$8,813,449	\$10,855
Western.....	275,523	1,771	1 in 235	\$4,510,419	\$2,547
Pacific.....	38,494	514	1 in 75	\$5,005,739	\$9,774
Total.....	746,683	4,733	1 in 158	\$65,752,000	\$13,886
Canada.....	57,100	907	1 in 63	7,988,077	\$8,807

The foregoing table of percentages offers a better idea than any other of the real decrease in the number of failures, apart from the amount of indebtedness. This will be understood by closely studying the foregoing figures as compared with the following, which extend the comparison back for some years. Thus, in 1876, every 60th man succumbed; in 1877, every 73d; in 1878, every 64th; in 1879, every 108th trader, while in 1880 it was only 1 in every 158 who laid down his load. In an army of nearly 750,000, an improvement so marked ought certainly to beget most hopeful confidence in its future chance of success, provided the requisite laws for the regulation and protection of such a host are forthcoming.

With regard to the comparisons contained in these figures, the circular goes on to say: "In the dark days which the trade of the country experienced between 1874 and 1878, the gloomy statistics which, by almost universal consent, it was our painful duty to compile, were regarded as the most unmistakable evidences of an unhealthy condition of the body politic. Now, however, that it is our pleasant task to compile figures of such a highly favorable character, the result should be regarded as a kind of concentrated testimony to the vastly improved condition of the community. For these failure statistics, be they favorable or unfavorable, may justly be regarded as the concrete result of the efforts yearly made by the vast number engaged in business pursuits, and indicate a healthy or a morbid condition of financial affairs as faithfully as the barometer does the state of the atmosphere. It is, therefore, with more than ordinary gratification that we submit the comparisons which these tables contain, confirming as they do the general conviction that the country is in a highly prosperous state; that the disturbing elements, so far as they affect trade and commerce, are exceedingly few, and that the prospect for the future is almost without a cloud, except such as might be created by departures from legitimate principles."

Notwithstanding this extremely promising state of affairs, there are some contingencies which even in times as prosperous as these should be looked for as almost certain to arise. The agency enumerates these as follows: "The rapidity of expansion, which is noticeable at present, is almost certain to result in speculations of a disastrous character. It should be borne in mind that within two years there has been an increase, from importation and home production, in the stock of precious metals in use, amounting to \$250,000,000. Most of this has been made

available as currency, and the consequence is that this sum has become an immense power toward inflation. This amount indicates an increase by one-third of the whole volume of the circulating medium as it stood at the date of the resumption of specie payments, and the result is already seen in the immense increase in the prices of stocks, and a very considerable advance in the values of staples. The speculative tendencies already developed by this increase in money facilities is shown in the remarkable statement that, during the year 1880, the amount of stocks sold on the New York Stock Exchange was 93,000,000 of shares, or nearly as much as the last two years combined, while in 1875 the shares sold numbered only 53,000,000. Another evidence of expansion may be noted in the magnitude of the exchanges recorded by the Clearing House in the city of New York for the first week of 1881. Deducting all the transactions arising from stock operations, the payments amounted to \$800,000,000 for a single week, showing the largest transactions of any week on record. The three indications above mentioned—the increase in money, the growth of stock operations, and the magnitude of exchanges—may be taken as evidences of a general condition which exists to a greater or less extent throughout the country. What the consequences of an expansion so marked will be, no one can foresee. Some, who are prone to desecry evil at every turn, fear a sudden collapse even when the sky is clearest, or, as Carlyle says, 'a bolt out of the blue'; while others who are equally well informed, and whose experience entitles them to credence, do not apprehend, so long as times are moderately prosperous, any disaster whatever. It is a fact, however, which may be pregnant with warning, that the failures in the last sixty days of the year 1880 have been not only numerous, but unusually important and significant. It is difficult to reconcile some of the recent disasters with the prosperous condition which is supposed to exist, though some of these failures may be accounted for by a departure from legitimate business principles, and by undertakings to attempt the control of the market for large products. Still, disasters are numerous, which seem almost unaccountable in the present prosperous condition of things. In this connection the recent events which have occurred in the Southern States call for attention. The casualties in the interior towns in that section have been very numerous and very startling, and jobbers and others who have large interests there are beginning to feel an apprehension which is hardly in consonance with the existing state of things elsewhere. The causes of the frequent failures in this direction are supposed to be overstocking in autumn, the bad weather which has pervaded a large area, and the slow delivery and realization of the cotton crop in consequence. In the West, Northwest, and in the Middle States, failures are not so numerous, but when they do occur, they are very significant in character, and very much calculated to disturb the happy frame of mind which the year under review has created."

The agency makes a very strong appeal for a National Bankrupt Law, which we cannot do better than insert as it is given:

"There is one thing, however, which is more calculated to interfere with the prosperity of the trade of the country than any other, and that is the absence of some provision by which debtors and creditors can alike be protected, and which should take the shape of a national insolvent or bankrupt law. 'The race of the diligent,' as it is called, by which one creditor seeks to get the advantage of another, is an element almost fatally destructive of the credit of hundreds of traders; while the disposition of debtors themselves to protect their friends to the detriment of outside creditors, is destructive of the confidence essential to the existence of credit. The peculiar experience which, as mercantile agents, we are daily encountering, enables us to discover the gradual shriveling up of credit in hundreds of cases where, with confidence and the prospect of an equitable distribution of assets, disaster might be avoided. The slightest intimation of prospective trouble, whether founded or not, in the condition of any trader, will cause almost every creditor to pounce down upon him with all the terrors of the law, in the hope that one may get advantage over another; while to the trader himself, thus threatened with disaster, the temptation to make preferences to those who will most readily assist him in his time of trial is almost irresistible. The laws of the various States differ so seriously, and in certain quarters so much favor attachments and recovery by summary process, that it is almost difficult to conceive how the business of the country can go forward without the intervention of some national remedy, for which the Constitution in its wisdom provides, and which certainly, at the earliest possible moment, should be made available. We repeat that there is nothing at the present moment in the shape of law so urgently demanding enactment as a national bankrupt act, if the internal commerce of the country is to be conserved, and if the prosperity we now enjoy is to continue."

British and American Artisans.

Mr. Mark Pattison, the other day, in an address delivered at Saltire, in Yorkshire, pointed out the essential deficiencies of British industrial capacity. He showed how, and tried to explain why, the English skilled workman is inferior, on the one hand, to the American, and on the other to the French artizan.

At the outset of this address the speaker called attention to the energy and ingenuity exhibited in the north, as compared with the south of England. This fact is chiefly interesting to us from the explanation suggested. There is, of course, a difference of origin between the two sections, as there was a strong infusion of Danish blood in the counties north of the Roman road which bisected the island, and which came to be known as "Watling street." Mr. Pattison, however, seems to think that the relative stolidity of the southern industrial population is mainly due to another cause, namely, the drainage of vigor and capacity

which took place through the emigration to America in the first half of the seventeenth century. There is no doubt that the great mass of colonists were natives of middle and southern England, and that, although a considerable contingent was furnished by what were once Danish settlements in East Anglia and the "Five Boroughs," very few indeed came from Yorkshire and Lancashire, the present centers of British industry. Mr. Pattison thinks this Puritan exodus meant a loss of blood and brain to southern England comparable with that experienced by France through Huguenot expatriation after the revocation of the Edict of Nantes. We do not agree with him in assigning such large effects to the emigration. There were enough Puritans left in England to carry through the great rebellion and establish the Commonwealth. They were always in a decided minority, however, and it is probable that the depletion of the best elements in their ranks, through the prolonged strain of civil war, is mainly chargeable with the collapse of their political system after the death of Cromwell, and the comparative exhaustion of the southern population ever since. It is none the less true and striking that in the American mechanic we see what the artizan of southern England might have been had the Puritan Commonwealth survived.

After praising the workman of Yorkshire and Lancashire, Mr. Pattison tells him plainly wherein he, and the American mechanic whom he most resembles, fall short of the French artizan. Of two elements which enter into the production of manufactured articles, namely, artistic design and mechanical ingenuity, the former is still possessed in a pre-eminent degree by the French as compared with the Anglo-Saxon race. We cannot expect to vie with them in this respect, because, says Mr. Pattison, our civilization is still young, and not yet permeated with artistic sensibilities. The subtlety of feeling and delicacy of hand requisite for goods whose value depends on style and fancy, imply a wide diffusion of good taste and hereditary aptitudes, as well as traditional processes, to provide the supply. In a word, says Mr. Pattison, the tasteful designs of the French pre-exist in their gracious manners; their polite usages and their elegant patterns are only different manifestations of the intense life of a sensitive and highly trained race in possession of an old tradition. What is here said of England is emphatically applicable to the United States. It is doubtless true that a young nation can hardly have fine manners or the daintiness of hand and eye generated by refinement of life.

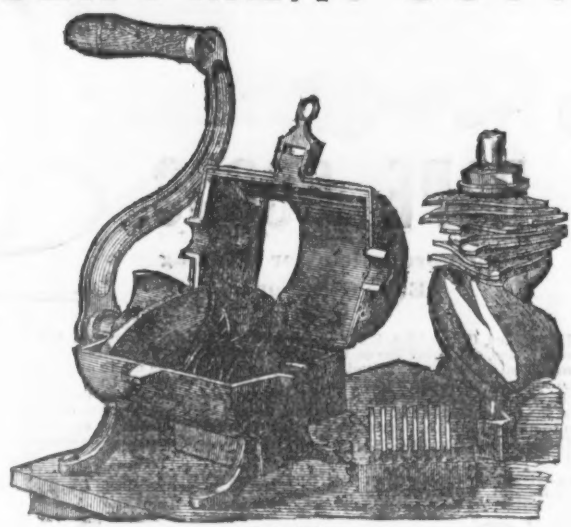
When we pass from industrial products intended for ornament, or in which a pleasing appearance is, at least, one of the ends in view, to things meant for use, we see at a glance the scope and source of American superiority. In an old country there are not only inherited aptitudes and pervasive tastes, but also a surplus of labor and superabundance of time. In America, where a scarcity of skilled labor has, as a rule, prevailed, there is a strong stimulus applied to the originating power; a great premium offered for the invention of labor-saving machines and tools. Mr. Pattison cites from a report of the last Paris exhibition a comparison of other exhibits of machinery with the American which is highly favorable to the latter. Of the French in particular it was said that, in the manufacture of machine tools, they do not seem to have grasped the leading principles of mechanics with sufficient thoroughness and insight to be capable of originating new forms and combinations. It was very different, we are told, in the American section, where novel arrangements of motion had given rise to new forms of framing, and where the designs have all the freshness of being struck from first principles. Mr. Pattison admits, too, that it is not merely in machines by which labor is economized that American intellectual fertility showed itself. This, of course, is demonstrated by our recent achievements in watchmaking, as well as by our earlier inventions of the revolver and the repeating rifle.

Now, the English artizan was not always behind the American workman in respect of inventive skill. Time was, Mr. Pattison reminds us, when all the new discoveries in practical science, and improvements in machinery and engineering, were first made in England; whereas now it is from America that all the new inventions come. It was natural enough that we should lag behind our English kinsmen in the colonial epoch, when we had, so to speak, no manufactures. But Mr. Pattison will find, we think, that the awakening of American inventive fertility responded promptly to the call for it; that it was contemporaneous, in fact, with the first development of American industries on a large scale.

But what is the specific force that stimulates an American mechanic to invent the innumerable things as to which the necessity of saving labor could not be noticeably felt? What is it that quickens his faculties, but does not operate in the case of the Lancashire or Yorkshire workman? There were only, it seems, 3,000 patents taken out last year in England, against about 12,000 granted in the United States. Mr. Pattison thinks one cause of the discrepancy is the greater expense involved in securing a patent right in England. We should lay scarcely any stress on this circumstance, from the fact that the cost of a patent is much less frequently borne by the inventor himself than by capitalists who promote the introduction of the invention. The fundamental question is, why is capital so slow in England and so prompt in America to encourage mechanical ingenuity? Because, compared with our own, England is an old country, clinging to routine and custom, which constitute to its thinking the accumulated wisdom of past generations; a country where nothing new can be made popular without an agitation and a clamor out of all proportion to the object to be gained. Formerly, when British capital invested in industry had to depend almost exclusively on native inventors, it was willing to risk more. But now it is safer and cheaper to wait and see a patent tested in America before undertaking the expensive and toilsome task of recommending innovations to the British public.

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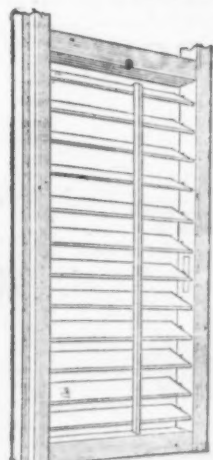
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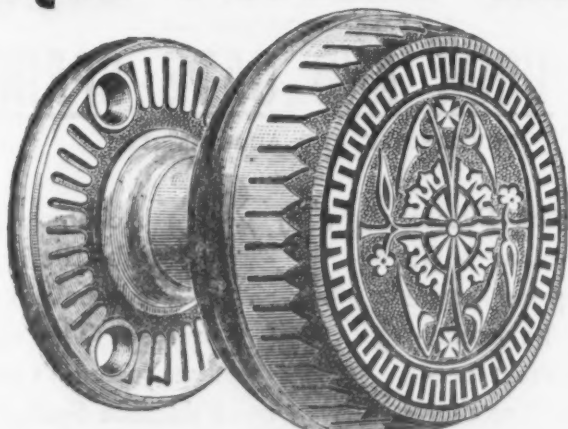
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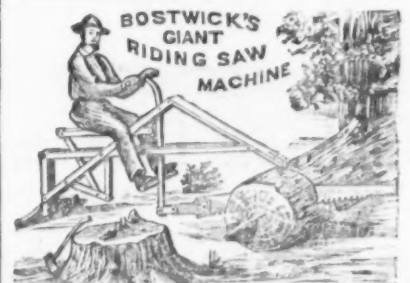
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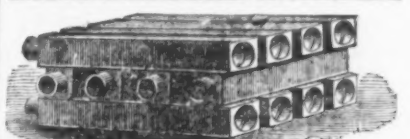
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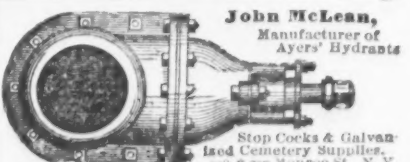
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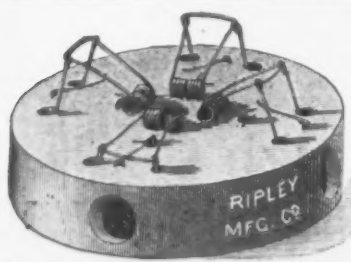
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For Scientific and Technical

purposes.

Several d. s. Pumps for the trade

at bottom prices.

AXLES

All kinds Wagon & Carriage Axles

Manufactured by the

LANBESONVILLE IRON WORKS.

LANBESONVILLE, N. J. Send for prices.

THE BELMONTLYLE OIL

PREVENTS RUST, TARNISH, &c.,

on Fire Arms, Machinery, Tools, Cutlery, Safes,

Saws, Skates, Stoves, Hardware, &c., without in-

jury to the polish. In use over 10 years. Highest

testimonials. Samples, 50 cents; three for \$1.00;

sent free of expressage. Send for Circular.

BELMONTLYLE OIL CO., Sole Manufacturers,

150 Front St., New York.

COVERT'S

Patent Improvement in

ROPE GOODS.

No more Splicing or Winding
Ends with Cord.



No. 1.

Rope Halters, Horse Ties, Cattle Ties, Halter Leads, &c., made by clamping the lap with steel rings, as shown in cut. Also, clamping the end with a ring to prevent unbraiding. This is all accomplished by machinery, and a superior article can be made at so much less cost, it will not pay any one to make up goods the old way. We are now prepared to furnish the trade the cheapest and best Rope Halters ever made. No. 1 illustrates the twisted and irregular form of the spliced Halter; also the insecure method of whipping the end with cord, which invariably comes off, and allows the rope to untwist. No. 2 illustrates the New Halter. It is made by clamping the laps with steel rings. The end is also secured with a steel ring, which will remain as long as the rope lasts. We have also a full line of



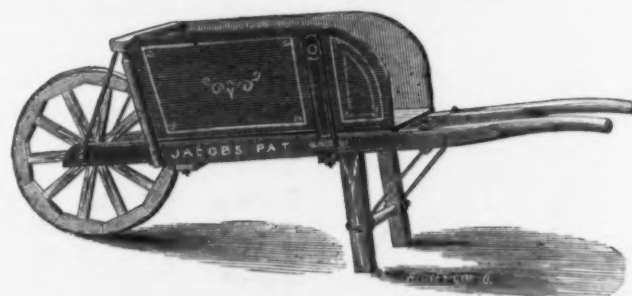
No. 2.

COVERT'S HORSE AND MULE JEWELRY.



Consisting of Covert's Celebrated Harness Snaps, Swivel Snaps, Open Eye Bit and Chain Snaps, Snap and Thimble for Horse and Cattle Ties, Rope Goods, consisting of Horse Ties, Cattle Ties and Halter Leads, Leather Horse Ties, Breast Chains, Halter Chains, Martingale Chains, Rein Chains, Post Chains, Post Rods, &c. These goods are far superior to anything of the kind on the market. They have from real merit become standard, and never fail to give entire satisfaction. They are sold by all leading jobbers in general and saddlery hardware at manufacturers' prices. Send for illustrated catalogue and price list. Address **COVERT MFG. CO.** Sole Manufacturers, West Troy, N. Y.

GARDEN OR FARM BARROW,
With Jacobs' Patent Wheel.



SET UP FOR USE.



FOLDED FOR SHIPPING.

These Barrows are made with double frames, bolted together, iron braced, and so constructed that by removing one bolt (the axle) and two nuts, can be folded flat down (see cut), and shipped at lowest rate of freight. But a moment's time is required to set up for use.

We also manufacture a full line of

RAILROAD, ORE, BRICK AND STONE BARROWS. Also,
Road Scrapers, Road Plows, Levelers, &c.

REVOLVING SCRAPER CO.,
COLUMBUS, OHIO, U. S. A.

The Edwards Manufacturing Co.

DETROIT, MICH.

SUCCESSORS TO THE

Union Spring Co.
CLEVELAND, OHIO.

Union Spring Co.
YPSILANTI, MICH.

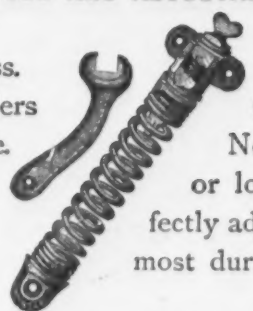
SOLE MANUFACTURERS OF THE

UNION DOOR AND GATE SPRINGS!

REVERSIBLE AND ADJUSTABLE.

A Pronounced Success.
all mechanics and builders
cheapest Spring made.
or pins to be broken
easiest and most per-
sonest, as well as the

Acknowledged by
to be the best and
No small castings
or lost. The simplest,
fectly adjusted. The hand-
most durable Spring made.



We Manufacture them in Four Sizes, either Coppered or Japanned.

No. 9—For Screen and Light Doors.
No. 7—For Large Doors and Gates.

No. 8—For Medium Weight Doors and Gates
No. 6—For Store Doors and Extra Heavy Gates

CORRESPONDENCE SOLICITED.

Wilson Bohannon,

Manufacturer of Patent

BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hard-
ware Trade. All sizes, with Brass and Steel Keys,
with and without chains.

Patent Horizontal Rim Cylinder Night Latch.

Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob

RIGHT OR LEFT HAND.

PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned.

Illustrated Catalogues and Samples sent upon application. **BROOKLYN, N. Y.**



THE STANLEY WORKS,
MANUFACTURERS OF
WROUGHT IRON BUTTS,
STRAP AND T HINGES
AND
DOOR BOLTS,
PLAIN, JAPANNED, GALVANIZED, BRONZED AND PLATED.

FACTORIES,
New Britain, Conn.
WAREHOUSE,
79 Chambers St., New York.

Special Notices.

TO MANUFACTURERS.

A Manufacturer's Agent about making a trip to all the principal Western cities, is open to negotiate with one or two manufacturers to represent their interests in that section. Having an acquaintance of many years with all the leading jobbing hardware buyers, is able to offer special inducements to such as desire to avail themselves of his services. Address
X. Y. Z.,
Office of The Iron Age, 83 Reade St., New York.

SECOND-HAND and NEW TOOLS FOR SALE LOW.

January List, No. 2.

Fit Lathe, 3 1/2 ft. swing, will turn a pulley as wide as 2 ft. face.
Fit Lathe, 16 ft. swing, will turn a pulley 30 inch face, with gear-cutting attachment.
Lathe, 100 in. swing, 18 ft. bed.
Lathe, 22 in. x 8 1/2 ft. New.
Lathe, 24 in. x 10 ft. New.
Lathe, 24 in. swing, 8 ft. bed.
Lathe, 20 in. swing, 8 1/2 ft. bed.
Lathe, 15 inch swing, 6 ft. bed. New.
Engine Lathes, 4 ft. bed.
Five Hand Lathes.
Horizontal Drilling Lathe, 24 in. swing, 19 ft. bed.
Hand Planer, 20 in. x 3 ft.
Planer, 22 in. wide, 6 ft. long.
Planer, 24 in. x 4 ft. New.
Planer, 24 in. wide, 6 ft. long.
Planer, 33 in. wide, 5 ft. long.
Planer, 32 in. wide, 8 ft. long.
Planer, 32 in. wide, 12 ft. long.
Dimension Planer, 24 in. x 13 ft.
Upright Drill Press, 16 in. swing.
Suspension Drill.
Upright Boring Mill, 4 ft. between uprights.
Boring Bar, 1 1/2 in. diam., 10 ft. long, self-feeding.
Boring Bar, 9 in. diam., 8 1/2 ft. long, self-feeding.
Forcing Machine, for forcing shafts off pulleys.
Combined Punch and Shear.
Six Horizontal Engine. New.
Vertical Engine, 8 x 12.
Two McKenize Cupolas, 4 ft. x 4 1/2 inside.
Ladies, &c., &c.
Seven Cranes.
Jig Saw.
Pattern Makers' Lathe.
Lathe, 16 x 6.
Drills, 26 in. New.
Shaper, 15 in. New.
Shaper, 9 in. New.
Shaper, 12 in. stroke.
Gear Cutter.
600 lb. Steam Hammer.
1000 lb. Steam Hammer.
Suspension Drill.
Rotary Shears.
Lot of cheap Lathes and Heads, Planes and Lathe Tools, Mandrels, &c.

The Wood & Light Machine Co. PATTERNS

Of Machinists' Tools are for sale at very low prices

For sale by

The Geo. Place Machinery Agency,
121 Chambers and 103 Reade Sts.,
NEW YORK.

An Experienced Lead Burner.

wanted for erecting and maintaining sulphuric acid chambers.

MATTHIESSEN & HEGELER ZINC CO.,

La Salle, Ill.

No. 53 Dey Street, N. Y.,

January 1, 1881.

The copartnership heretofore existing between John H. Butler and Thomas D. Huntington, under the firm name of Butler & Huntington, has this day been dissolved by the withdrawal of said Thomas D. Huntington.

Mr. Butler and Mr. John C. Constant have this day formed a copartnership for continuing the business at the same place, under the firm name of Butler & Constant. Mr. Butler will pay all obligations, and receive all assets of the old firm of Butler & Huntington.

JOHN H. BUTLER,
THOMAS D. HUNTINGTON,
JOHN C. CONSTANT.

A GERMAN GENTLEMAN, having done business successfully for 12 years in this country on his own account in the Hardware and Store line, and with best references, wishes to make arrangements with parties for the sale of their goods in Germany, and also for the purchase of German goods for this market, either on commission or on a salary. Address, at once,
F. H.,
Office of The Iron Age, 83 Reade St., New York.

The Sherman Process Co.

9 Pemberton Square, Boston, Mass.

Issue Licenses to use the Process for the

Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens

Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of

the product, saves fuel and labor, and does not re-

quire any change in furnace or manner of working.

See page 17 of The Iron Age of Oct. 25th, 1877.

SECOND-HAND
DROP PRESSES

BOUGHT, SOLD & EXCHANGED.

BEECHER & PECK,

Lock Box 122, New Haven, Conn.

One-Thousand-Pound
STEAM HAMMER

FOR SALE.

In good order, and can be seen at our works.

WOOD, SMITH & CO.,

Fort Plain, N. Y.

FURNACE MANAGER.—A gentleman of technical education and large practical experience in this country and Europe, thoroughly practical in all departments of iron making, desires a position as manager of blast furnaces of any capacity and with all kinds of stock. Address,
PRACTICAL FURNACE MANAGER,
Office of The Iron Age, 83 Reade St., New York.

Special Notices.

Rolling Mill for Sale.

SPECIAL NOTICE TO IRON MEN.

A Rare Opportunity for Investment.

The undersigned Assignee and Trustee of the RIVERSIDE ROLLING MILL COMPANY, a corporation organized under the laws of Ohio, invite proposals for the purchase of the property and real estate of the above-named Rolling Mill Company.

The opportunity is one of the rarest in the Rolling Mill and Iron Men. The Mill is a new one, and is located in the village of Riverside, just outside of the corporate limits of Cincinnati. It has excellent river and railroad facilities, probably unsurpassed. The Plate Mill has capacity for a very large product, particularly of Boiler Plate of large dimensions. There are also a sixteen-inch Bar Mill and a Guide Mill, both having full complement of rolls. The Bar Mill and Guide Mill have not been set up. The works have been in operation but a few months, and already have a large and lucrative custom. It has had more orders than could be filled, and is at present in operation, more recently under the practical direction of Mr. Wm. H. Carruthers. The mill was built under the superintendence of one of the best men in the country.

AARON A. FERRIS, Assignee,
W. H. CARRUTHERS, Trustee,
of the Riverside Rolling Mill
Company,
Cincinnati, Ohio.

For Sale.

7 x 10 DOUBLE ENGINE, Link Motion.
Suitable for Mine, Furnace or Quarry hoisting.
Been used one week only.

A. G. BROOKS & WINEBRENER.

261 N. 3d St., Philadelphia.

FOR SALE.—NUT AND BOLT MACHINERY.—By the National Machinery Co., of Cleveland, O.—The only specialists in this line in the U. S. Two new Hot-pressed Nut Machines, medium. One 2d-hand Hot-pressed Nut Machine, small size. Three second-hand Hot-pressed Nut Machines. One 2d-hand Fordick Rivet and Heading Machine. Six new Chapin Headers, for carriage and small work. Bolt Cutters, second-hand—we have 12 of different makes, Wiley & Russell, Mayo, Merriam, &c. Three new small National Bolt Cutters. Six new No. 4 National Bolt Cutters, cut to 1 1/2. Two new No. 5 National Bolt Cutters, cut to 2 1/2. Two new No. 6 National Bolt Cutters, cut to 3 1/2. Four new Double-head National Bolt Cutters. The National Head and Case file on these, we guarantee, place them ahead of anything offered in the market. Three new Single Rapid Bolt Cutters. Four new Double Rapid Bolt Cutters, suitable for bolt shops, &c. We manufacture complete outfits for bolt and nut making, including such tools as Cam Heads, Upsetters (cold and hot), Bolt Pointers, Head Shavers, Nut Burers, Tire blank machy., &c.

Chilian Mill for Sale.

One Double Chaser Chilian Mill, complete with gearing for driving it. Suitable for grinding ores, fire-brick, clinders, &c.

Sketch with measurements on application.

A. G. BROOKS & WINEBRENER,

261 N. 3d St., Philadelphia.

Desk Room To Let.

At 110 Chambers St., New York, on the ground floor.

W. C. HARLOW.

VALUABLE WATER FRONT

ON EAST RIVER,

Between Eighth & Twenty-third Sts.,

FOR SALE.

Suitable for iron works or manufacturers, where large water facilities are required. About 50 acres, including land under water. Address,
CHAS. S. BROWN, 77 Liberty St., N. Y.

ON HAND AND FOR SALE.

Horizontal Boiler, 42 in. x 10 ft., 28 4-in. tubes, 3/4 shell, 7-16 heads.

Horizontal Boiler, 42 in. x 10 ft., 28 2-in. tubes, 5-16 shell, 3/4 heads.

Vertical Boilers, with Bases, Grates and Fixtures:

42 in. x 7 ft., 20 2-in. tubes, shell and fire-box 3/4 in., heads 5/8 in. New.

36 in. x 6 ft., 20 2-in. tubes, shell and fire-box 5-16 in., heads 5-16 in. New.

30 in. x 6 1/2 ft., 27 2-in. tubes, shell and fire-box 5-16 in., heads 5-16 in. New.

30 in. x 6 ft., 25 2-in. tubes, shell and fire-box 5-16 in., heads 5-16 in. Second hand.

15 1/2 x 20 Horizontal Engine, 9 ft. x 15 in. band wheel. Jacob Naylor.

12 x 24 Horizontal Engine, segment fly wheel 4500 lbs. James Moore.

10 x 20 Horizontal Engine, band wheel 7 ft. x 12 in.

12 x 12 Vertical Engine, band wheel 54 in. x 12 in.

7 x 12 Vertical Engine, band wheel 42 in. x 10 in.

A. G. BROOKS & WINEBRENER,
261 North Third St., Philadelphia.

TO MANUFACTURERS.—A gentleman who has

traveled over ten years among the Eastern and Western Hardware trade, wants a line of special-

ties in Hardware goods to sell on commission on account of manufacturers. Personal attention given. First-class references. Address J. L.,
Office of The Iron Age, 83 Reade St., New York.

OPEN-HEARTH STEEL.—A gentleman having

six years' experience in one of the leading open-hearth works of this country will be open for an engagement January 1, 1881. Is competent to design, superintend construction and manage works when completed. Address
OPEN-HEARTH STEEL,
Office of The Iron Age, 83 Reade St., New York.

Sanderson Bros. Steel Co.

A limited number of shares for sale by

EDWARD FRITH & SON,

241 Pearl Street, New York.

Special Notices.

For Sale.

Second-Hand Machinery,
CHEAP.

We will close out these machines at half their

real value. Every engine or machine mentioned here is practically new, being thoroughly repaired and guaranteed by us to be in good order.

One 15 H. P. Erie City Iron Works Boiler, tested to 150 lbs. cold water pressure. \$150.00

One 8 1/2 slide valve side crank engine, with pump, fly-wheel and governor. 250.00

One 8 1/2 slide valve side crank engine, with pump, fly-wheel and governor. 185.00

One 8 1/2 center crank ditto, with reversing link. 190.00

One 7 1/2 center crank engine. 130.00

One 6 1/2 center crank ditto, all complete. 250.00

One 8 1/2 center crank ditto. 160.00

One 5 1/2 center crank ditto. 165.00

One 8 1/2 portable engine and boiler. 350.00

One 8 1/2 ditto, ditto, ditto. 275.00

One double back-gear press, with 3 in. stroke, table 24 3/4 in.; cost, \$450; price, 300.00

One 27 in. x 12 ft. screw cutting engine lathe 300.00

One 13 in. x 5 ft. " " " " 105.00

500 drop and post hangers for shafts, 1 1/2 to 3 in. from \$1.65 to \$6.50 each, ready babbitted to fit any shaft.

YORK & SMITH,

Cleveland, Ohio.

For Sale.

FOUNDRY AND MACHINE SHOP. Established 1842. Well stocked with Patterns and Tools. Business good. Satisfactory reasons for selling. Address
A. L. VAIL,
Middletown, N. Y.

For Sale.

One pair CHILL ROLLS, 25 inches diameter, 50 inches long; necks, 16 inches diameter, 13 1/2 inches long; wabblers, 14 inches diameter, 7 1/2 inches long.

One pair PINIONS, 25 inches diameter, 30 inches to outside of shrouds; necks and wabblers same as on chill rolls.

Six COUPLING BOXES, for above rolls and pinions.

One POPPET VALVE ENGINE, 20-inch bore, 6-foot stroke, with cast-iron fly-wheel in light section, 25 feet diameter; rim of wheel, 12 x 12 in. Engine is now in position at our mill.

BRITTON IRON & STEEL CO.,

Cleveland, Ohio.

For Sale.

Hardware Business of 20 years' standing. Stock will invoice about \$10,000. Fresh and in good condition. To a party with the money this is an opportunity that seldom offers.

For particulars inquire of

JOHN BINDLEY,

126 Fifth Street,

Allegheny City, Pa.

For Sale.

One Horizontal Boiler, one 14 in. flue, 16 feet long, 30 in. diam. Price, \$150.00

One Horizontal Boiler, two 11 in. flues, 18 ft. long, 22 in. diam. Price, \$175.00

One Locomotive Boiler, two 12 in. flues, 12 ft. long, furnace 5 ft. Price, \$200.00

One Union Boiler, 8 ft. long, 30 in. diam., with 3 in. tubes. Price, \$150.00

One Upright Boiler, 6 ft. high, 30 in. diam., with 3 in. tubes. Price, \$150.00

One Upright Boiler, 3 ft. high, 36 in. diam., with 3 in. tubes. Price, \$150.00

One Engine and Boiler complete and ready new, with engine cylinder 24 in. by wheel 5 ft. diam. Upright boiler 42 in. diam. 28 two in. tubes. Price, \$650.00

One seven H. P. hoist engine. Price, \$75.00

One new engine cylinder 24 in. by wheel 5 ft. diam. Ten per cent. off to any party purchasing the whole lot. Also one R. R. Locomotive Standard gauge cylinders, 16 1/2 in. weight, 6,000 lbs. Needs a little repairing. Price very low.

R. FRAZER, Agent, Bordentown, N. J.

For Sale.

Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.

Address
HARDWARE,
Box 366, Salina, Kansas.

For Sale.

HARDWARE.—The controlling interest or the whole of a Jobbing Hardware House, already established and doing a profitable business; located in one of the large Western cities. For further particulars, address
C. A.,
Office of The Iron Age, 83 Reade St., New York.

For Sale.

LARGE SLOTTED, 6 ft. between Columns, 4-ft. Table, stroke 18 in., ind. cross and circular movements. A heavy, well-built tool; in first-rate order; will be sold low. Photo. on application.

A. G. BROOKS & WINEBRENER,

261 N. Third Street, Philadelphia.

For Sale.

A fine manufacturing property, located at Clayville, Oneida Co., New York, 11 miles south of Utica. Two distinct Water-powers, Steam Engine, Shafting, Hangers, Pulleys, &c. Works built and used for manufacturing Scythes, Forks, Hoes, &c. For terms, description, &c. address
B. F. AVERY & SONS, Louisville, Ky.

FOR SALE,

Job Lots and Bankrupt Stocks Hardware.

Great bargains offered to the trade.

A. W. WHEELER,

141 Lake St., Chicago, Ill.

ENGINE AND BOILER
FOR SALE.

Steam Engine, 6 x 15, with 15-horse-power boiler, feed pump and heater, nearly new and in good order. One (1) second-hand "Peck" Lifter, not geared; will raise hammer of 300 lbs. in weight.

BEECHER & PECK,

Lock Box 122, New Haven, Conn.

Notice.

To Manufacturers of Farming Tools.

I want a party to manufacture a NUMBER ONE MAY KNIFE on Royalty, or will sell the patent on reasonable terms.

A. ZIMMERER,

Cafe Biehof & Zimmerer, Hardware,

Nebraska City, Neb.

Special Notices.

Second-Hand and New
Machinists' Tools.

January 5, 1881.

One Engine Lathe, 50 in. x 20 ft. Ames, new.

One Engine Lathe, 35 in. x 24 ft. Ames, new.

One " " 32 in. x 16 ft. Ames, new.

Two " " 24 in. x 12 ft. Ames, new.

One " " 20 in. x 12 ft. Ames, new.

Two Engine Lathes, 18 in. x 8 ft. Jones & Lamson.

Two Engine Lathes, 18 in. x 7 ft. " " new.

Two Engine Lathes, 19 in. x 8 ft. Pond, new.

Two Engine Lathes, 19 in. x 10 ft. Pond, new.

One Engine Lathe, 16 in. x 6 ft. New Haven.

One " " 16 in. x 6 ft. Ames, new.

One Engine Lathe, 15 in. x 6 ft. Cady, good order.

One Engine Lathe, 14 in. x 5 ft. Harris, good order.

One Engine Lathe, 14 in. x 4 1/2 ft. Putnam, good order.

One Engine Lathe, 11 in. x 5 ft. Prentice, new.

Two Fox Lathes.

Six Hand Lathes, 11, 14 and 16 in. x 4 1/2 to 7 ft. bed.

One 4-in. Shaper. Hendey Mach. Co. new.

Four 9 in. " " Hewes & Phillips.

One 15-in. stroke Shapers. Hendey Mach. Co. new.

One 24 in. x 5 ft. Planer. Ames.

One 24 in. x 5 ft. Planer. Whitcomb, new.

One 24 in. x 5 ft. " " Moore & Wyman.

Two 36 in. Drills, bk. geared and self-feed. L.W. Pond.

One 34 in. Drill, Bk. Geared.

Two 24 in. Drill, bk. geared or self-feed. Ames, new.

Three 20 in. Drills. Prentice, new.

One 6-spindle Horizontal Drilling Machine.

One 5-spindle Horizontal Drilling Machine.

One No. 4 Wilder Punch Press. New. Geared.

One No. 6 " " Shear Geared.

Belted, Shafting, Pulleys and Miscellaneous Machinery.

E. P. BULLARD, 14 Dey St., New York,

GENERAL EASTERN AGENT FOR

Akron Iron Co.'s Hot Polished Shafting.

PHILADELPHIA, JAD. 1, 1881.

TO THE TRADE.

The undersigned, the last representative of the firm of J. BARTON SMITH & CO., established in 1842, finding it no longer possible to alone give proper attention to the increased demand for its celebrated brand of Files and Rasps, has transferred the business to the J. BARTON SMITH COMPANY. Thanking the trade for its liberal patronage in the past he respectfully solicits a continuance of the same for the new firm.

CHARLES F. CRIPPS.

Office and Works of the J. BARTON SMITH CO.,
Nos. 211, 215, 217 New Street,
PHILADELPHIA, Jan. 1, 1881.

Referring to the above, the undersigned beg to assure the trade that they will faithfully preserve in the future the high reputation of the well-known goods of the late firm of J. Barton Smith & Co., and with largely increased facilities will be able to promptly fill all orders they may be favored with.

In addition to the line of Files and Rasps, they will also manufacture a full line of Wood Saws, Butchers' Saws, &c., of equal merit to the best made, soliciting the favors of the trade at lowest market rates. Respectfully,

CHARLES F. CRIPPS, President.

GILBERT PARKER, Treas. and Genl. Agt.

Trade Report.

Office of THE IRON AGE, 1
WEDNESDAY EVENING, January 19, 1881.

During the past week the Wall street markets have been active and strong. The ruling rates for call loans on the Stock Exchange were 5% @ 6%, exceptional loans having been made both above and below these figures.

The importations of specie and bullion at this port during the week ending January 14, were \$124,772, consisting of \$80,820 in gold and \$43,952 in silver, as against a total of \$328,726 for the week ending January 17 last year. The importations since the 1st of January and since the 1st of August compare as follows with the movement during the corresponding periods last year:

	Since January 1, 1880.	1881.
Gold.....	\$1,230,899	\$1,368,064
Silver.....	53,973	115,961
Total.....	\$1,284,872	\$1,484,025
Since August 1, 1880.....	\$78,359,788	\$75,386,036
Gold.....	2,516,333	3,113,495
Silver.....	70,876,091	72,272,541
Total.....	\$78,492,124	\$75,386,036

During the week government bonds advanced $\frac{1}{8}$ @ $\frac{1}{4}$ —the latter $\frac{1}{8}$ and $\frac{1}{4}$ s. State bonds were quiet and firm; railroad bonds strong, with a decided upward tendency. We give below the closing quotations of governments.

The general stock market has been alternately strong and weak, but in the main strong. The telegraph stocks were strong early in the week, but later experienced a decline.

The special meeting of the Board of Directors of the Western Union Telegraph Company was concluded at 1.30 o'clock this afternoon. Among those present at the meeting were the following: Norvin Green, Edwin D. Morgan, W. H. Vanderbilt, Augustus Schell, Harrison Durkee, Samuel F. Barger, Joseph Harker, Hamilton McKay Twombly, John Van Horne, Cornelius Vanderbilt, Wilson J. Hunt, Edward S. Sanford, John R. Duff, D. O. Mills, Oliver H. Palmer, James H. Bunker, Samuel A. Munson, Anson Stager, Edwin D. Worcester and William D. Bishop. The meeting was reported to have been held with closed doors, and was very harmonious. At the close of the session Dr. Green said the agreement had been unanimously adopted by the directors of the American Union and Western Union Companies, and would be by those of the Atlantic and Pacific Telegraph Company, who will meet this afternoon at the general offices, No. 145 Broadway.

The general features of the agreement, said Dr. Green, have already been published; but as the matter is considered by the board as being still unfinished business, the directors did not think it judicious to make the details public. It was not improbable that the document, as a whole, might be kept private until after the meeting of the stockholders and their ratification of it. This meeting would be held about 15 days hence.

The principal dealings were in the railroad stocks usually most active, and in telegraph stocks. We give below the closing quotations of active stocks.

The following is an analysis of the bank totals of this week compared with that of last week:

	Jan. 8.	Jan. 15.	Comparison.
Loans.....	\$304,080,000	\$303,664,700	Dec. \$1,415,300
Specie.....	61,918,000	65,492,000	Inc. 3,574,000
Legal tenders.....	13,871,400	15,086,100	Inc. 1,214,700
Total reserve.....	75,780,400	81,148,800	Inc. 5,368,400
Deposits.....	255,787,700	292,376,800	Inc. 36,589,100
Reserve.....	75,780,400	81,148,800	Inc. 5,368,400
Required.....	71,446,025	73,094,200	Inc. 1,648,175
Surplus.....	4,339,375	8,054,600	Inc. 3,715,225
Circulation.....	18,426,200	18,425,000	Dec. 1,200

IMPORTS AT NEW YORK.

For the week ended January 15:

	1879.	1880.	1881.
Total for week.....	\$4,228,482	\$6,084,726	\$9,434,024
Prev. reported.....	4,267,832	6,915,599	6,803,512

Since Jan. 1..... \$6,496,314 \$13,000,325 \$16,287,536

Included in the imports of general merchandise for the week were articles valued as follows:

	Quantity.	Value.
Anvils.....	337	\$1,561
Brass goods.....	65	6,606
Bronzes.....	5	58
Chains and anchors.....	50	3,669
Copper.....	12,293	1,293
Cutlery.....	243	50,614
Fine.....	6	683
Gas fixtures.....	3	791
Guns.....	100	20,510
Hardware.....	131	5,043
Iron, pig, tons.....	4,433	47,959
Iron, sheet, tons.....	67	5,346
Iron ore, tons.....	4,501	13,799
Iron, other, tons.....	2,713	75,707
Metal goods.....	178	17,027
Nickel.....	28	9,471
Old metal.....	5	3,004
Plated ware.....	2	4,873
Percussion caps.....	1	189
Saddlery.....	15	1,370
Steel.....	11,103	77,004
Silverware.....	7	198
Tin, boxes.....	17	175
Tin, 8,559 slabs 777,738 lbs.....	1	197,083
Wire.....	1,249	9,475
Zinc.....	151,233	6,190

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended January 15:

	1879.	1880.	1881.
For the week.....	\$4,247,380	\$5,687,823	\$6,480,466
Prev. reported.....	4,499,375	4,999,157	6,774,531

Since Jan. 1..... \$8,676,955 \$10,685,980 \$13,254,797

For week ended January 15:

	1879.	1880.	1881.
Total for week.....	\$101,368	205,500	330,868
Previously reported.....	101,368	205,500	330,868

Total since January 1, 1881..... \$305,868

Same time in 1880..... 328,826

Same time in 1879..... 1,102,609

Same time in 1878..... 1,051,859

Same time in 1877..... 735,628

Same time in 1876..... 1,539,923

Same time in 1875..... 7,666,848

Same time in 1874..... 2,050,029

Same time in 1873..... 5,977,133

Same time in 1872..... 915,092

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. 6's 1881 registered.....	101 1/2	101 3/4
U. S. 6's 1881 coupon.....	101 1/2	101 3/4
U. S. 5's 1881 registered.....	100 1/2	100 3/4
U. S. 5's 1881 coupon.....	100 1/2	100 3/4
U. S. 4 1/2's 1881 registered.....	112 1/2	112 3/4
U. S. 4 1/2's 1881 coupon.....	112 1/2	112 3/4
U. S. 4's 1897 registered.....	113 1/2	113 3/4
U. S. 4's 1897 coupon.....	113 1/2	113 3/4
U. S. Currency 6's 1895.....	113 1/2	113 3/4
U. S. Currency 6's 1896.....	113 1/2	113 3/4
U. S. Currency 6's 1897.....	113 1/2	113 3/4
U. S. Currency 6's 1898.....	113 1/2	113 3/4
U. S. Currency 6's 1899.....	113 1/2	113 3/4

The following were the closing quotations of active shares:

	Bid.	Asked.
American Union Telegraph.....	87	87 1/2
American District Telegraph.....	66	67
Atlantic and Pacific Telegraph.....	40 1/2	41
Alton and Terre Haute.....	43	44
Arizona.....	43 1/2	44
Burlington and Quincy.....	172 1/2	173
Bur. Cedar Rapids & North.....	78	79
Central Arizona.....	3 1/2	3 3/4
Canada Southern.....	87 1/2	88 1/2
C. C. and I. C.....	24	24 1/2
Colorado Coal and Iron.....	39 1/2	40
Central Pacific.....	95 1/2	96
Cedar Falls.....	29	30
Col. Chic. C. and Indiana.....	92	92 1/2
Chic. St. Louis and New Orleans.....	54 1/2	55
Chesapeake and Ohio.....	23 1/2	24
U. S. 1st Pref.....	33	34
U. S. 2nd Pref.....	26	27
Central Iowa.....	40	41
Denver and Rio Grande.....	89 1/2	90
Deadwood.....	13	14
Delaware, Lack. and Western.....	109 1/2	110
Delaware & Hudson Canal.....	102 1/2	103
Express-Adams.....	130	131
Wells, Fargo.....	114 1/2	115
U. S. 3rd Pref.....	59	60
United States.....	59	60
Excelsior Mining.....	6 1/2	7
Erie.....	51 1/2	52
U. S. Pref.....	93 1/2	94
Erie and Western.....	41 1/2	42
Homestead.....	27 1/2	28
Hannibal and St. Joseph.....	50 1/2	51
U. S. Pref.....	107 1/2	108
Int. and Great Northern.....	134 1/2	135
Illinois Central.....	134 1/2	135
Iron Mountain.....	60 1/2	61
Indiana, Bloom. and Western.....	58	59
Keokuk and Des Moines.....	49 1/2	50
Kansas and Texas.....	47	48
Louisville and Nashville.....	92	93
Louisville, New Albany and Chic.....	134 1/2	135
Lake Shore.....	34 1/2	35
Little Pittsburgh.....	125 1/2	126
Michigan Central.....	125 1/2	126
Morris and Essex.....	124 1/2	125
Metropolitan Elevated.....	37	38
Manhattan Elevated.....	37 1/2	38
Mobile and Ohio.....	28	29
Marietta and Cincinnati Pref.....	13 1/2	14
Nash. and Chattanooga.....	8 1/2	9
New Central Coal.....	27	28
New York Elevated.....	124	125
New York Central.....	153 1/2	154
New Jersey Central.....	49 1/2	50
Northwestern.....	135 1/2	136
U. S. Pref.....	145	146
Ohio.....	43 1/2	44
U. S. Pref.....	110	111
Ohio Central.....	24 1/2	25
Ontario Silver.....	33 1/2	34
Ontario and Western.....	35 1/2	36
Omaha.....	49 1/2	50
Oregon Navigation.....	142	143
Rock Island.....	137	138
P. T. and Buff.....	40	41
Panama.....	32 1/2	33
Pacific Mail.....	37 1/2	38
Peoria, Decatur & Evansville.....	32 1/2	33
Rome, Watertown & Og.....	36	37
Reading.....	64	65
Quicksilver.....	57 1/2	58
U. S. Pref.....	57 1/2	58
Silver Cliff.....	4 1/2	5
Standard.....	23	24
Stromont.....	1 1/2	1 3/4
Sutro Tunnel.....	1 1/2	1 3/4
St. Paul.....	120 1/2	121
U. S. Pref.....	120 1/2	121
Texas Pacific.....	120 1/2	121
Union Pacific.....	40 1/2	41
Wabash.....	48 1/2	49
U. S. Pref.....	92 1/2	93
Western Union.....	115 1/2	116

MINING STOCKS.

The following were the closing quotations of mining stocks:

	Bid.	Asked.
Amie.....	46	47
Alice.....	6.50	7.00
Alta Mont.....	1.80	2.00
American Flng.....	33	35
Bell Isle.....	45	49
Bechtel.....	60	60
Buckeye.....	12.00	16.00
Bull Dom.....	3.75	3.75
Bulwer.....	1.45	1.50
Bole.....	5.25	5.87 1/2
Calaveras.....	1.00	1.00
Cale. B. H.....	1.00	1.00
Climax.....	44	45
Consolidated Virginia.....	2.10	2.15
Consolidated Imperial.....	1.00	1.00
Consolidated Pacific.....	1.00	1.00
Chrysolite.....	5.87 1/2	6.12 1/2
Dunderberg.....	1.30	1.30
Dahlonega.....	9	10
Durango.....	17	18
Eureka C.....	21.00	21.00
Findley.....	27	29
Great Eastern.....	25	26
Gold Placer.....	44	44
Gold Strike.....	2.30	2.30
Goodshaw.....	1.20	1.30
Granville.....	5	7
Green Mountain.....	4.80	4.90
Haskell.....	7.30	7.30
Horn Silver.....	13.50	13.50
Independence.....	26	28
Lacrosse.....	27	29
Leadville.....	39	39
N. Y. C.....	1.40	1.40
N. Y. & U.....	1.00	1.05
N. Bell L.....	43	43
Red Bluff.....	30	40
Rappahannock.....	70	72
Robinson.....	7.00	7.37 1/2
S. Hite.....	54	58
Silver Cliff.....	4.35	4.65
Tioga.....	70	72
Tuscarora.....	13	14
Unadilla.....	13	14
Willshire.....	1.30	1.40

GENERAL HARDWARE.

The volume of business during the week under review was satisfactory, when the season and the difficulties attending transportation are considered. The manufacturers of Strap and T Hinges held a meeting in this city to-day, but their business was not concluded at the time of going to press. The Stamped Ware manufacturers have been in session for several days at the Astor House, but at the close of business to-day their action had not transpired.

We have received the following circulars:

STEBBINS' MOLASSES GATES.

Office of SARGENT & Co.,
37 Chambers Street,
New York, January 19, 1881.

To the Trade: For above goods we shall be pleased to furnish quotations, assuring dealers that our prices are reduced to a rate consistent with our increased and more economical facilities for producing them.

Very respectfully, SARGENT & Co.

New Britain, Conn., January 19, 1881.

To the Trade: We beg to withdraw all quotations for Stebbins' pattern Molasses and Oil Gates, and invite inquiry from parties desiring to purchase at low figures.

LANDEIS, FRARY & CLARK.

MIDDLETOWN, CONN., JANUARY 15, 1881.

At a meeting of the Pump Manufacturers of the United States, held at the Osburn House, Rochester, N. Y., January 12, 1881, the following prices were unanimously adopted:

	Dis. per cent.
Cistern and Pitcher Pumps.....	50
Drive Well, Yard, Set Length Lift and Set Length Force Pumps.....	45
Brass Cylinder Cistern and Pitcher Pumps, Iron and Brass Cylinder Force Pumps (excepting Horizontal, Power and Rotary), either single or double-acting, including Hand Boiler Pumps.....	40
Rotary Barrel Pumps.....	35
Hydraulic Rams and Garden Engines.....	30

Respectfully soliciting your orders, we remain, very truly yours,

W. & B. DOUGLAS.

The Putnam Nail Co., Boston, Mass., have issued a revised price list for Horse Shoe Nails under date of the 1st instant, which is as follows:

	12	10	9	8	7
Nos.....	12	10	9	8	7
Nos.....	6	5	4	3	2
Nos.....	2	1	1	1	1

The list is subject to discount 10 per cent.

The Phosphor-Bronze Smelting Co., Ltd., of Philadelphia, have issued a circular to the trade, in which they say: "We beg to advise you that we have moved the offices of the Phosphor-Bronze Smelting Co., Limited, to No. 512 Arch street, Philadelphia, and would request that hereafter all letters, remittances, orders, &c., be sent to that address. In connection with our new offices we have opened a sales and show room, where we will be prepared to exhibit our various products and fill orders for Phosphor-Bronze Ingots, Castings, Wire, Rope, Wire Cloth, Sheet and Roll Metal, Rolled Bolts, Draw Rods, Sash Chains and Cords, Tubes, Plates, Brewer's Kettles, Cold Rolled Pump Rods and numerous articles manufactured from our superior alloys."

The demand for Nails is not active, but the tone of the market as regards price has not undergone any change, and we continue to quote 101. to 60d. \$2.90 @ \$3 per keg net, according to size of order.

Hermann Boker & Co., have in stock a new Razor, which is styled "Gardner's Challenge 1880." The Razor, which is a handsome example of hollow grinding, is in every respect well finished, and will compare favorably with any hollow-ground razor in the market. It is offered to the trade at \$12 per dozen, net.

John O. Jewett & Sons, Buffalo, N. Y., have issued their 1881 illustrated catalogue and price list. They show a large assortment of House-furnishing Goods, including Refrigerators, Water Coolers and Filters, Bird Cages and Japanned Tinware. From their revised discounts, which we print below, a fair estimate of the extent and variety of their assortment will be obtained:

DISCOUNT SHEET TO APPLY TO JOHN O. JEWETT & SONS' ILLUSTRATED CATALOGUE AND PRICE LIST, JANUARY, 1881.

Page.	Class.	Discount per cent.
to 13, Refrigerators.....	A.	25
to 17, Ice Chests.....	A.	25
Refrigerator Pans and Galvanized Pails.....	A.	25
Ice Pitchers.....	A.	25
to 26, Water Coolers.....	B.	25
Cooler Stands.....	B.	25
to 28, Water Filters.....	B.	25
to 32, Bird Cages.....	C.	33 1/2
to 69, " " Brass.....	D.	25
to 72, " " Wood.....	E.	25
to 77, Bird Cage Trimmings, Brackets, Scales, &c.....	F.	25
to 78, Toilet Ware.....	F.	25
Slop Jars.....	F.	25
Slop Pails and Foot Baths.....	F.	25
to 81, Bathing Apparatus.....	F.	25
to 93, Cuspidors, Wash Bowls and Pitchers.....	G.	25
Crumb Brushes and Trays, Registered Trademark.....	G.	25
Tumbler Drainers, Cake Closets and Tea Canisters.....	G.	25
to 95, Japanned Tea Trays.....	H.	25
to 98, Children's Table Toys.....	J.	25
Copper, Tin and Nickel Tea Kettles.....	K.	20
to 101, Coffee Pots.....	K.	20
Scoops, Universal.....	K.	20
Dust Pan and Brush, Jet Molds, Can Openers, Potato Mashers.....	K.	20
Dover Egg Beaters, Grater, Pot Cleaners.....	K.	20
Ice Chisels, Ice Picks.....	K.	20
Ice Tongs, Coover's Measures and Sifter and Dipper, the New Fryer, Coal Tongs.....	K.	20
Razor Strops.....	L.	15
Kat and Mouse Traps.....	L.	15
to 113, Hand Saws, Knife Sharpeners, &c.....	L.	15
Steel and Nickel Fire Sets, Poole's Lemon Squeezers.....	L.	15
to 113, Hand Saws, Knife Sharpeners, &c.....	L.	15
Cast Bake Pans.....	L.	15
Wood Knife Boxes, Table Mats, Lap Boards.....	L.	15
Carpet Sweepers.....	L.	15
to 121, Sherwood's Goods.....	M.	20
Japanned Goods.....	N.	5
Moss Baskets.....	N.	5
Flower Vases, Hanging Baskets.....	N.	5
Ster Slaves, Corn Poppers.....	O.	net
Dish Covers, Cover Lifters, Aquariums.....	O.	net
Baskets, Silverware, Friction Mats.....	O.	net
Ice Cream Freezers (Centon-ice Cream Freezers (Favorite).)	P.	33 1/2
to 126, Iron Reservoir Vases.....	R.	20
to 144, Coal Vases and Coal	S.	20

accord with its principles and theory of action, or write for any desired information having in view the utilization of these suggestions.

The writer has had grave doubts heretofore as to the practicability of any of the propositions for arrangements, because they have left the jobber no proper footing to stand upon, and has steadily opposed them. The proposed new deal looks practical. He is acquainted with most of the manufacturers and all the executive committee, and is confident that this theory of protection to the jobbers can be fully carried out.

The jobbers should not let this opportunity pass, but instead, as one man, throw the weight of their influence in its favor. We shall thus protect ourselves. **JOBBER.**
January 15th, 1881.

BRITISH IRON MARKET.

[Special Report by Cable to The Iron Age.]
LONDON, Wednesday, January 19, 1881.

Scotch Pig.—Prices have been irregular during the week, fluctuating in both directions, but closing steady, with a large business doing. The following are maker's prices:

Gartsherrie	63/
Coltness	64/
Glenarnock	59/
Eglinton	54/

Manufactured Iron.—There is a steady demand, with a fair business doing. Prices are steady. Best Staffordshire Bars, £7 @ £7.10/.

Steel Rails.—A large business has been done under an increasing demand, and prices are firmer. Ordinary Sections are quoted £6.5/ @ £6.15/.

Iron Rails.—There has been a heavy demand during the week, with large transactions and stronger prices. Welsh are quoted £5 @ £5.10/.

Old Rails.—The brisk demand continues, and a further advance of 10/ is reported in Old Ts, which are now quoted at £4.7/6.

Scrap.—Is quiet, the offerings being light, with fair sales. Wrought is firmer—quoted at £3.10/.

IRON.

American Pig.—The tone of the Iron market this week is firm and the inquiry active, with considerable business transpiring. We quote Foundry No. 1, \$25; Foundry No. 2, \$22; Gray Forge, \$20 @ \$21.

Scotch Pig.—Sales of Scotch Iron during the week aggregate about 1,000 tons various brands; the arrivals during the same period were light. Ocean freights have advanced to 5/ @ 7/6, and partly on this account, and partly in sympathy with the firm tone of the English market, holders ask from 50 cents to \$1 per ton advance on last week's quotations. We quote Eglinton, \$22 @ \$22.50; Carnbroe, \$22.50; Coltness, \$24.50 @ \$25; Glenarnock and Gartsherrie, \$23.50 @ \$24.

The demand for Foreign Bessemer Iron is active, and within a few days sales amounting to 30,000 tons are reported, at \$26.50 @ \$27.50, laid down here.

Rails.—For Steel Rails the inquiry is very active, and we hear of some heavy contracts pending, which, it is expected, will be placed in a day or so. Sales of American Steel are reported aggregating 20,000 tons, the terms of which have not transpired. In Iron Rails no new business has come to our notice. We quote: Steel, at mill, \$57.50 @ \$62.50; and Iron Rails, \$46 @ \$49.

Old Rails.—The transactions in Old Rails have been very heavy during the week, and holders are asking \$1 @ \$2 per ton over the figures they would willingly have accepted not many days since. Among the sales reported are 1700 tons D. H. to a Pittsburgh consumer at \$30, ex store—terms, spot cash; 1500 tons Ts (American), at \$30; and 500 tons Ts, ex store, at \$28.25. We quote \$29 @ \$31 for Ts and D. H. respectively.

Scrap.—The only business that has come to our notice during the week was in small lots. The tone of the market, however, is strong, and selected No. 1 Wrought, from yard, is quoted \$30 @ \$31.

METALS.

Copper.—The market here during the week under review has been tolerably firm, some more activity being displayed, leading to sales of 200,000 lbs. Lake Superior at 10 1/4¢, on the spot, the asking price toward the close being 10 3/4¢. For Baltimore 18 1/2¢ is asked. London reports no further change per cable, Chili bars being worth £62.10/ and Best Selected £68. The English annual reviews, just to hand, make no mention either of Spain's exuberant production or of the cessation of shipments hence to Europe, two rather important factors. "London, Jan. 8, 1881.—The improvement which occurred in prices last week has been maintained, and a fair business has been transacted. The price of Chili Bars on Monday advanced from £62.15/ to £63.5/; but has since been rather fluctuating, and down to £62 accepted. The better tone probably arises from the more favorable statistics which were published on the 1st inst., the total visible stock having been reduced to 60,610 tons, against 62,220 tons on the 1st of December, and 62,140 tons on the 1st of January. It is also interesting to note that the stock is less than upon the first of any month last year. To commence the new year the visible stock was 1530 tons less than that with which last year opened, while the price of Bars was £4 per ton less." Manufacturers remain as of late: Bottoms, 31¢; Braziers, according to size, 28¢ @ 34¢; Circles, 31¢ @ 34¢; Segment Sheets, 31¢; Fire-box Sheets, 28¢; Sheathing, 26¢; and Bolt Copper, 28¢.

Tin.—Our market has ruled very quiet at somewhat lower prices, due entirely to speculative causes. Meanwhile no important lots have changed hands. London

cables Straits Tin £80, and Singapore \$28.25 per picul. To the United States no shipments of Tin have been made from the Straits settlements during the first half of this month, while to London the export has been 700 tons. The shipments from the Straits to England, as shown above, are heavy, and shipments have also been made to Europe from here; hence there would rather have been cause for an improvement in this market, instead of which, following the London tendency, it droops. We quote at the close, large lines: Straits, 10 1/4¢ @ 20¢, and Australian, 10 3/4¢.

The monthly and annual statistics from Europe have made their appearance. "London, January 8, 1881.—The statistics published on the 31st ult. were not so satisfactory as those issued at the end of November, the visible stock having increased to 13,584 tons, against 12,986 tons on the 30th November last, and 14,333 tons on the 31st December, 1879. The opening price for this year was £91, the same as that quoted at the beginning of 1880, while the stock is 1249 tons less, so there seems little doubt that at least a similar advance to that which took place last year will be again effected. The deliveries in London and Holland during December were not so good as in November, being 1541 tons against 2120 tons. The shipments from Straits last month were 750 tons and from Australia 900 tons. The total shipments from Straits and Australia last year were 10,703 tons, against 10,986 tons in 1879, and the total deliveries in London and Holland in 1880 were 20,751 tons, against 21,250 tons in the previous year. A sale is just announced for the 25th inst. at Rotterdam of 18,200 slabs Banca and 4800 slabs Billiton. Tin Plates have remained quiet; the demand is moderate and the supply ample. We quote at the close, large lines, ordinary brands, per box: Charcoal Bright, \$5.87 1/2 @ \$6.25; do. Ternes, \$5.25 @ \$5.37 1/2; Coke Tin, \$4.90 @ \$5, and do. Ternes, \$4.87 1/2. At Liverpool the market retains its firmness. The meeting of Welsh makers alluded to in our previous report has effected nothing, and Coke Tin closed at 15/.

Lead.—This metal has relaxed into quietude, sales being of little importance for the week, but prices remain steady at \$4.90 @ \$5. Refined is very firm at 5 1/2¢ @ 5 3/4¢. "London, Jan. 8, 1881.—There is hardly any change to be reported in the state of this market, the demand continuing rather quiet, but prices have been steadily upheld for all descriptions." Manufacturers are quoted as follows: Sheet Lead, 7¢; Lead Pipe, 6 1/2¢; Tin-lined ditto, 15¢, and Block Tin Pipe, 40¢.

Spelter and Zinc.—Since we last reported Common Domestic Spelter has persevered in its attitude of great firmness, and is worth 5 1/2¢, with moderate dealings, while in Silesian nothing has transpired, being held at 5 1/2¢ @ 5 3/4¢. The inundations in Silesia have much to do with the advance in Spelter at Breslau. "London, Jan. 8, 1881.—The sudden rise which took place in this metal at the end of last week has not only been maintained, but prices for Silesian have further advanced, while English Hard has also been quoted at improved rates. The tone appears good, and higher prices are looked for."

Antimony.—Has remained moderately active at 15 1/2¢ for the Cookson brand, and 14 1/2¢ for the remaining ones.

COAL.

Trade at the present moment may be said to be very brisk on a small scale. Work has been going on only half the time, and the roads, by reason of snow and ice, appear to be sending down only about half the quantity of Coal that they would usually haul in a given time. Some Coal men estimate that the amount coming to tide-water is about one-quarter of the capacity of the mines. The weather is cold, yards in the city are short of Coal and the local demand for Coal is very brisk, so that the circular rates are very rarely obtained. This little tempest in a tea-pot makes the trade feel brisk, and it is confidently reported that there will be a large demand and good prices all through 1881. While the shipping points are now clear of ice, there is more or less difficulty reported in the harbor from the ice coming down the Hudson and filling slips and giving trouble generally, making it difficult to get Coal. In the city trade there is no little delay in delivering Coal, owing to the snow and ice in the streets.

The line trade is taking all the larger sizes of Coal, and it has been reported that in some of the inland towns the yards are bare, and actually in want. On this account, and because of the local demand, there has been much talk in regard to going to work full time, and an attempt was made to induce the companies to do so. This afternoon Mr. Hoyt, of the Pennsylvania Coal Company, said, in reply to a question, that work would be full time this week, and that next week half time would be resumed. He looked upon the idea of a short supply as altogether ludicrous when there were round 500,000 tons in stock. The real difficulty in obtaining Coal and the apparent scarcity are, he said, incident to cold weather and an unusual quantity of snow.

Full-time work for a week will probably have little or no effect upon the market. Prices are unchanged, and are reported as about at the circular rates: Lump Lohg, \$5.25 @ \$5.40; Lump and Broken of other kinds, \$4; Egg, \$4.20 @ \$4.40; Stove, \$4.45, and Chestnut scarce and hardly quotable. Freight is high on account of the delay in getting loaded.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	10.16	10.17
Copper Bottoms	10.14	10.15
Yellow Metal	10.09	10.10
Brass, heavy	10.11	10.12
Brass, light	10.09	10.10
Composition, heavy	10.13	10.14
Lead, heavy	10.04 1/2	10.05
Tea Lead	10.03 1/2	10.04
Zinc	10.02 1/2	10.03
Pewter, No. 1	10.01	10.02
Pewter, No. 2	10.00	10.01
Wrought Iron	22.00	23.00
Light do.	22.00	23.00
Store Plate	12.00	13.00
Machinery do.	16.00	17.00
Grate Bars	8.00	9.00

The prices current for Rags, &c., are as follows:

Canvas, Linen	15¢ @ 4 c.
White Cotton, New	25¢ @ 4 c.
White, No. 1	25¢ @ 4 c.
No. 2	25¢ @ 4 c.
Second	25¢ @ 4 c.
Soft Woollens	10¢ @ 11¢
Mixed Rags	10¢ @ 11¢
Gunny Bagging	10¢ @ 11¢
Just Butts	10¢ @ 11¢
Kentucky Bagging	10¢ @ 11¢
Book Stock	10¢ @ 11¢
Newspapers	10¢ @ 11¢
Waste Paper and Scraps	10¢ @ 11¢
Kentucky Bale Rope	10¢ @ 11¢

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending January 18, 1881:

Danish West Indies.	Quan.	Val.
Coal, tons	305	\$1,724
Glassware, cs.	19	163
Hdw., cs.	8	104
Books, pkgs.	1	33
Petrol, gals.	5610	738
Silverware, cs.	3	54
Cars	1	99
Wdware, cs.	21	49
Nuts, blbs.	33	33
Iron safe	1	105
Sp. turp., gal	100	50

Dutch West Indies.
Ptm., gals. 390,625 48,408

Dutch East Indies.
Ptm., gals. 155,000 18,990

Porto Rico.
Glasware, cs. 77 366
Hdw., cs. 377 377
Rosin, blbs. 27 37
Ag. imp. pkgs. 10 10
Nails, kegs. 15 83
Carriages, cs. 8 850
Sew. ma., cs. 1 45
Ptm., gals. 12,500 15,614

Hamburg.
Sew. ma., cs. 180 6,198
Ag. imp. pkgs. 27 45
Hdw., cs. 22 1,172
Lub. oil, blbs. 4,075 4,075
Mach'y, cs. 37 3,844
Spokes, cs. 64 1,129
Ptm., gals. 204,800 25,090

Rotterdam.
Ptm., gals. 66,301 43,000
Lub. oil, blbs. 350 9,616
Hdw., cs. 3 365
Pumps, pkgs. 3 660
Pldware, cs. 74 1,172
Ag. imp. pkgs. 6 300
Mf. iron, pkgs. 20 260

Bremen.
Ag. imp. pkgs. 1 200
Mach'y, cs. 8 479
Ptm., gals. 257,500 24,000
Hdw., cs. 23 470
Mf. iron, pkgs. 8 405
Clothes, cs. 1 40
Hdw., cs. 9 175

Liverpool.
Ag. imp. pkgs. 65 4,373
Clothes, cs. 214 7,022
Telph. mtl., pg 660
Pldware, cs. 6 2,098
Pig. ma., pgs. 3 3,387
Hdw., cs. 4 4,772
Ore, box 1 30
Oil tank 1 30
Sew. mach. cs. 2 205
Guns, cs. 1 295
Metal g'ds. cs. 4 100
Staves, car lds 1 285
Nails, kegs. 1 3,440
Watch, cs. 1 1,000
Mf. iron, pkgs. 7 225
Pumps, pkgs. 4 50
Revolvers, cs. 100 26,600
Electrics, cs. 1 1,839
Lub. oil, blbs. 120 1,839

Cardiff.
Mach'y, cs. 1 480

Hull.
Clothes, bxs. 30 582

London.
Ptm., gals. 904,865 88,281
Guns, cs. 200 3,800
Hdw., cs. 24 853
Pldware, mtl., pgs 7 133
Tin, slabs. 1078 18,203
Lub. oil, blbs. 225 3,113
L. rollers, cs. 1 40
Mach'y, cs. 18 486
Clothes, bxs. 303 5,594
Mf. iron, pkgs. 12 150
Amunition, cs. 2 120
Ag. imp. pkgs. 107 6,550
Carriages. 1 300

Glasgow.
Hdw., cs. 100 107
Ag. imp. pkgs. 38 2,260
Mach'y, cs. 7 894
Copper, cs. 9 1,759
Spokes, cs. 4 100
Clothes, pgs. 12 765

Bristol.
Sew. ma., cs. 1 30
Ptm., gals. 347,480 25,000

British North American Colonies.
Coal, tons 225 950
Rosin, blbs. 20 53

British Guiana.
Ptm., gals. 23,000 2,875

British Honduras.
Ptm., gals. 1,755 250
Hoops, blbs. 125 201
Glasware, cs. 3 19
Hdw., cs. 10 113
Sew. ma., cs. 1 137
Hdw., cs. 4 39

Marseilles.
Crucible hds. 7 300
Alcohol, blbs. 913 16,300

Bilbao.
Ptm., gals. 152,300 10,000

Havre.
Sew. ma., cs. 51 600
Machinery, cs. 10 1,365
Ag. imp. pkgs. 58 2,884
Rosin, keg. 1 22
Hdw., cs. 1 100
Mf. iron, pkgs. 2 230

Cadix.
Hdw., cs. 55 1,110
Ptm., gals. 20,000 2,400

Seville.
Ptm., gals. 161,354 10,406

Bayrout.
Ptm., gals. 141,000 10,577

French West Indies.
Carriages. 5 1,230
Ptm., gals. 3,500 453
Car. mtl., pkgs 17 380
Hdw., cs. 3 180
Sew. ma., cs. 2 100

Argentine Republic.
Ptm., gals. 30,000 2,450
Clothes, bxs. 34 572
Hdw., cs. 194 4,441
Block, pkgs. 3 472
Car mtl., pgs. 11 665

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending January 18, 1881:

Hardware.	Quan.	Val.
Yule, G.	cs. 5	100
Selby, Samuel	cs. 11	100
Mach'y, cs.	11	100
Mount, Jas. T.	cs. 5	100
Hdw., cs.	5	100
Rosenthal & Co., J.	cs. 1	100
Cask, 1		100
Cases, 6		100
Latham & Jeffries	Cases, 4	100
Windmiller, Louis	Gun barrels, case, 1	100
Wicks & Bro., J. G.	Irish harps, cs. 7	100
Wiebusch & Hilger	Hdw. Co.	100
Cutlery & hardware	pkgs. 20	100
Boker, H. & Co.	Cases, 5	100
Cases, 12		100
Horse Nail Co.	Mdse. pkgs. 5	100
Betzmaur, C. L.	Guns, case, 1	100
Bloomfield, J. C. & Co.	Mach'y, cs. 12	100
Dowling & Lawrence	Chain, 1	100
Loew, Edgar	Hdw. Co.	100
Pratt & Farmer	Case, 1	100
Strasburger & Co.	Guns, case, 1	100
Sellers, W. B.	Cutlery, cs. 2	100
Schuyler & Duane	Guns, case, 1	100
Guns, case, 1		100
Sanderson & Son	Ship's shaft, 1	100
Dupham, Buckley & Co.	Cases, 3	100
Winchester & Arms Co.	Cases, 5	100
Clark Thread Co.	Mach'y, cases, 60	100
Bruckmann & Lor-	Knives, cs. 1	100
Knives, cs. 1		100
Gregson, McCulloch &	Co.	100
May, cs. 15		100
Thompson, John	Case, 1	100
Ward, Aseline	Cutlery, cs. 4	100
Harley & Graham	Arms, cs. 2	100
Mdse. pkgs. 5		100
Dowling, Sheldon & Co.	Cases, 3	100

Merchants' Dis. Co.
Mdse. pkgs. 8
Guns, cs. 3
Arms, cs. 2
Cutlery, pkgs. 5
Hilger, Ernest
Synthes, case, 1
Baw, 14
Drexel, Morgan & Co.
Cases, 10
Depo, James
Cutlery, case, 1
Folsom, D. B.
Mdse. cs. 8
Arms, cs. 2
Gardiner, Mr.
Hills, cs. 1
A. Field & Sons
Cases, 15
Cases, 19
Hoes, cs. 21
Nails, kegs. 2
Vices, case, 1
Chains, cs. 35
Anvils, 28
Mdse. pkgs. 35
Wire, cs. 2
Patterson Bros. & Co.
Mdse. cs. 2
Steiner Bros. & Patter-

Hayth.
Ptm., gals. 4,960 613
Sew. ma., cs. 25 571
Mf. iron, pkgs. 25 571
Sheet al. c. bxa 4 216
R. R. mtl., pcs. 382 2,300
Cutlery, cs. 6 126
Iron, pkgs. 41 65
Carbines, cs. 11
Nails, kegs. 115 439
Hdw., cs. 84 1,348
Grindstones, 23
Glasware, cs. 29 30
Mach'y, pgs. 482 7,175
Ag. imp. pkgs. 9 61
Copper, case, 1 39
Nails, kegs. 27 237
Pumps, pkgs. 3 100

Venezuela.
Glasware, cs. 12 79
Ptm., gals. 11,900 1,520
Mach'y, cs. 4 80
Nails, kegs. 50 169
Hdw., cs. 9 435
Mf. iron, pkgs. 8 42
Car mtl., pgs. 6 405
Rosin, blbs. 62 239
Carriage. 1 600
Sew. ma., cs. 21 534

Africa.
Ptm., gals. 102,750 11,816

Mexico.
Ptm., gals. 38,500 5,098
Hdw., cs. 100 216
Mach'y, pgs. 62 24,322
Lump g'ds, pgs 5 238
Zinc, cs. 2 43
Iron, pkgs. 17 205
Quicksilver, 200 7,650
Revolvers, cs. 1 100
Nails, kegs. 26 100
Pistols, cs. 1 180
Sew. ma., cs. 4 40
Cutlery, cs. 6 614
Ag. imp. pkgs. 60 1,577
Tel. mtl., pgs 4 341
Mf. iron, pkgs. 61 1,400
Glas fixt., cs. 2 82
Tacks, cs. 3 30
Cartridges, cs. 6 60

Brazil.
Ptm., gals. 10,978 2,575
Tinware, cs. 7 107
Mf. iron, pkgs. 10 140
Car. mtl., pgs 2 20
Cutlery, cs. 15 675
Clothes, cs. 9 90
Mach'y, cs. 8 86
Hdw., cs. 58 440
Revolvers, cs. 1 35

China.
Mf. iron, cs. 1 18
Nails, kegs. 209 653
Ptm., gals. 50,000 6,375
Rosin, blbs. 290 695
Clothes, bxs. 24 447
Coal, tons. 638 2,617

British West Indies.
Nails, kegs. 142 550
Hdw., cs. 35 493
Tinware, cs. 5 55
Block, pkgs. 8 53
Car mtl., pgs 8 65
Carriages. 10 1,925
Ptm., gals. 22,940 2,406
Hoops, cs. 10,000 1,200
Mf. iron, pkgs. 18 348
Sew. ma., cs. 1 15
Y. m. she'g, cs. 1 15
Brass, bags. 359 360
Iron bars, 24 447
Wires, spoils 20 55

Philadelphia.
Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Jan. 18, 1881.

Pig Iron.—The market is steady, and with more activity in finished iron holders of raw material are showing a strong front. A very fair business has been done in Foundry Irons for Eastern delivery, but some claim to be asking more money, but under ordinary circumstances \$25 may still be regarded as a fair quotation for No. 1. Specially favorite brands command a dollar more, but others again may occasionally be had at as much less, so that, as a matter of fact, prices are about where they were two or three weeks ago. The heavy production, as shown by the number of furnaces in blast, enables buyers to keep themselves well supplied with stock, and it is neither possible nor desirable to push prices much further. The market appears to have a healthier tone, however, and the

necessities of consumers has led to steady buying, and thus, in a measure, relieved any anxiety that may have been felt as to the immediate course of the market. There is very little of the speculative element manifested, and buying is done only in proportion to actual requirements. The outlook in this respect was never better than at present. Consumers in all branches of trade have an abundance of orders, so that the heavy output at furnaces is placed without much effort. We have not heard of any transactions calling for special remark, but a considerable amount of business has been done at \$18 @ \$18.50 for White Iron; \$19 @ \$19.50 for Mottled; \$20 @ \$21.50 for Gray Forge; \$22 @ \$22.50 for No. 2 Foundry, and \$24.50 @ \$25.50 for No. 1. Charcoal Iron has been sold at \$33.50 @ \$35 for Warm Blast, and \$36 @ \$38 for Cold Blast

of 50¢ to \$1 per ton would be made to secure desirable orders. We are informed that the demand from the West and Northwest is likely to be very large. One mill in Illinois is said to have recently taken orders for about 25,000 tons, and there are other orders to come out soon. No recent sales of American Rails have been made in this market, except in lots of small amount. For Southern delivery we hear of sales of foreign Rails at \$44 @ \$45, and other contracts are under negotiation. The outlook indicates an active business during the next three months, and somewhat higher prices are looked for. In the meantime, we quote \$46.50 @ \$47 for heavy and \$50 @ \$53 for light Rails. Market firm.

Spikes—Have been sold in large lots at about \$2.65, and, for small lots, the market may be considered firm at \$2.75.

Old Rails—The firmness noticed last week appears to have increased rather than otherwise, and sales have been made at a further advance on rates then quoted. A large business is said to have been done, but particulars cannot be obtained with any degree of certainty, as most of the lots sold were laid in New York. In this market 1000 tons of D. H.'s were sold at \$30 in store, and three or four lots of T's at \$28 @ \$28.25. Holders are now asking an advance, and it would be difficult to place an order within 50¢ per ton of the above rates. Stocks are nearly exhausted, and held by strong parties, but without a corresponding advance in new Rails it seems scarcely possible that consumers can respond to holders' views.

Steel Ends—Are offered at \$31, with \$30 bid.

Scrap Iron—Is firm, sales of selected lots at \$20 @ \$30; some sold at still higher rates. Medium lots are held at \$27 @ \$28. Cast at \$20 @ \$21, and Stove Plate at \$17. Market very firm.

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., Jan. 13, 1881.

Pig Iron—The firmness noted in our last report continues, and as the market grows stronger the demand appears to increase. Consumers, who until quite recently have been holding off in anticipation of lower prices, are anxious to buy, particularly for forward deliveries, while on the other hand, sellers are less anxious to make additional sales. Coke Iron from native ores may be quoted at \$21 @ \$21.50, 4 mos., for Cold-short Forge; and \$22 @ \$22.50, 4 mos., for Neutral; Bituminous Coal and Coke Smelted from Lake ores, \$21 @ \$22 for Cold-short; \$22 @ \$23 for Neutral; \$23 @ \$24 for cinder mixture Red-short; and \$26 @ \$27 for all-ore do. Foundry grades, \$23.50 @ \$25.

Bessemer Iron—Is in active demand, with limited offerings, and prices are strong and tending upward. Sales at \$27 @ \$27.50 for round lots, and in a small way \$28 @ \$28.50. We are cognizant of the purchase of a lot of extra quality English at seaboard at equal to \$31, delivered in Pittsburgh.

Ores—There is no longer any room to doubt about the Ore market that Lake Ores are destined to rule fully as high this year as last. While it is expected that the production of Lake Ores this year will exceed that of any former year, estimated by competent authorities at 2,225,000 tons, the consumption, it is also confidently expected, will be larger than ever before. It is calculated that it will require 1,300,000 tons to supply the steel works of the country, and if so, there will be but a comparatively small amount for general use. The stock of Ore on the dock at Cleveland is unusually light; it is said that it does not exceed 25,000 tons, and it is pretty certain to be exhausted before the resumption of navigation.

Manufactured Iron—The situation has not varied much during the week, with the exception possibly that there is a firmer feeling in sympathy with Raw Iron. Merchant Bars are generally quoted at 2.25¢ rates, 60 days, 2 per cent. off for cash, although it is probable that a desirable, well-assorted order could still be placed at 2.15¢, or even 2.10¢. Sheet Iron, 3.70¢ @ 3.75¢ for No. 24; Skelp, 2.20¢ @ 2.30¢; Tank, 2.90¢ @ 3¢; Hoop, 3¢ @ 3.10¢.

Nails—The market continues strong, with an increasing inquiry. Stocks are very much reduced and the production is being kept well under control. We repeat former quotations, \$2.85, 60 days, with the usual abatement of 10¢ per keg on car-load lots, and 2 per cent. off for cash.

Wrought Iron Pipe—There is a fair business for the season. No change in card or discounts; the latter 65 to 67½ per cent. Boiler Tubes remain unchanged at 40 off. Oil Well Casing and Tubing 21¢ and 70¢ per foot, net.

Railway Supplies—Steel Rails are still quoted strong, with the mill here sold way ahead. Old Iron Rails are in demand and hard to get; one of our largest consumers reports having been on the market for some time past and offering to buy at the prices asked, but unable to get any. Railway Spikes firm, with an increasing inquiry; we now quote at 2½¢, 30 days, for large lots and 3¢ in a jobbing way. Splice Bars are firmer, and may be quoted at 2.25¢ @ 2.35¢.

Steel—Best brands of Refined Cast Steel quoted at 1½¢; do. Machinery Steel, 7¢; Bessemer and Open-hearth Machinery Steel, 5¢; do. Spring, 5¢; do. Plow, 4½¢.

Scrap—There is an increasing demand and the market is firmer, in sympathy with Pig Iron, although there has been no quotable change in prices during the past week. No. 1 Wrought, \$28 @ \$30 per net ton; Car Axles, \$38 @ \$40; Car Springs, \$42 @ \$45; Locomotive Tire, \$38 @ \$40; Boiler Plate, \$32 @ \$34; Wrought Turnings, \$20 @ \$22; old Car Wheels, \$32 @ \$35, gross; Cast Boring, \$16 @ \$17, gross.

Coke—No change in prices: \$1.50 per ton, on cars at works; \$1.65 @ \$1.75 for small foundry orders.

Coal—Trade in this important interest, owing to the continued suspension of navigation, is quiet, so far as regards our river operators, but railway operators are very

busy, and could do more but for the difficulty in obtaining cars. In down-river markets stocks are rapidly being reduced, and with the source of supply shut off, prices are going up.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts.,
CHATTANOOGA, Jan. 17, 1881.

General business is brisk as compared with last month, and trade in every line is better than usual in January. No omen is wanting to indicate other than a heavy and profitable business later in the winter. Spring will probably open early, as it usually does after severe winters, and this will facilitate the progress of new railroad lines and the building of heavy manufacturing plants. The weather during the week has been rough and disagreeable, ending with hard freezing.

Pig Iron—There has been nothing new worth mention in the Pig Iron trade for some time. There is no change in the situation, except a slow and steady improvement in trade, which tends more especially to reduce the supply of higher grades. We quote: No. 1 Foundry, \$25 @ \$27; No. 2 Foundry, \$23 @ \$25; Gray Forge, \$20 @ \$22; White and Mottled, \$18 @ \$20; Car Wheel Metal, \$38 @ \$40.

Miscellaneous Articles—There has been no material change in any articles in this list. We quote: Old Rails at \$26 @ \$28; Wrought Scrap, \$20 @ \$24; Cast, \$15 @ \$17; Old Wheels, \$28 @ \$30.

Ores—We quote: 50% Brown Hematite, per ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25.

Nails—Are fairly steady at 3.25¢ rates, usual discount on 200-keg lots and for cash.

Manufactured Iron—There is nothing new in the market. Bar rather stubbornly continues quiet, while Pig and Scrap are firm, and rather proportionally higher than any finished materials. We quote: Bar at \$2.35 rates; Railroad Spikes, \$3; Track Bolts, \$4; Trestle Bolts, \$4.50; Fish Plate, \$2.50.

Coal—We quote Lump at 22¢ @ 25¢ per bushel, delivered. The cities south of the Tennessee Valley have again been for a week past seriously embarrassed on account of short supplies for household use.

Coke—Furnace Coke, \$3 per ton at furnace; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails—We quote: Steel Bars at \$62.50 for American makes, \$60 for foreign. Iron, \$48 @ \$50; Small T is firm at \$55.

Lead—We quote: Pig Lead, 4½¢ @ 5¢.

Steel—Plow Slabs, 3 in. and under, \$4.70; Black Diamond, ordinary sizes, 13¢.

CLEVELAND.

JANUARY 17.—Ores.—There is little new to say about the Ore market since our last. There is considerable inquiry for Ores for present delivery, and stocks unsold are becoming lessened week by week. Regarding prices of Ores for next season's delivery, would say that producers of strictly Bessemer Steel Ores show no disposition to reduce from last year's prices. On the contrary, they will hold firm for the same. As to Ores for general Iron purposes, it is a little too early to settle on prices. The better way seems to be to wait 30 to 60 days; it will be more easy to determine what the price will probably be on Mill and Foundry metals, and base prices on Ores adapted to such Irons accordingly. We quote same as last week:

Bessemer Speculars and Magnetics.—\$9.00 @ \$10.00
Bessemer Hematites..... 7.00 @ 9.00
Memorine Range Ores..... 7.50 @ 9.00

MILL ORES.
Speculars and Magnetics..... 8.00 @ 10.00
Hematites..... 6.50 @ 8.00
Fix Ores..... 9.00 @ 10.00

JANUARY 15.—Pig Iron.—The demand for all grades of Pig Iron increases daily. The strong advance in all kinds of Scrap Iron has induced the mills to go outside and buy Pig Iron to a considerable extent. It is self-evident that any further advance in the price of Old Rails will turn the tide of trade toward Pig Iron. Wheel makers continue to order Charcoal metal in large quantity, and foundries are buying liberally. Prices on all grades are firm, but at this writing show no advance over former quotations. **Scrap Iron**—Large quantities of Scrap Iron have changed hands at prices ranging from \$30 to \$32 a ton.

BOSTON.

JANUARY 15.—The interesting feature of the Iron market has been the firmer tone of some forms of Manufactured Iron and the rising tendency of Old Rails and Wrought Scrap, without any corresponding improvement in the Pig metal. Any upward movement in Iron usually begins the other way, but Pig Iron is still only moderately active and prices show no change. We quote American Pig Iron at \$24 @ \$26 for No. 1 X; \$21 @ \$22.50 for No. 2 X, and \$20 @ \$22 for Gray Forge. These prices are f. o. b. at the port of shipment. Small spot lots will command \$2 per ton higher. **Foreign Pig** has continued dull and unchanged. We quote Langlois Iron at \$24 @ \$24.50; Gartscherrie and Glenarock at \$22.50 @ \$23; Eglinton at \$21 @ \$21.50; and Middlesborough (Clarence) at \$17.50 @ \$18. The low prices of Middlesborough and Eglinton and other low grades of foreign Pig Iron are causing them to take the place, to some extent, of old Machinery Iron for foundry purposes. Old Rails have been marked up about \$2 a ton all round, as a result of a considerable speculative movement. Foreign Rails are now held at \$30 @ \$31 for D. H.'s and \$28 @ \$29 for Tees. American Rails are held at \$32 @ \$33. It is certain, however, that these prices cannot be sustained unless a material improvement takes place in Manufactured Iron. A report comes to us from Philadelphia that the advance in Old Rails was the result of some kind of a combination. **Manufactured Iron** is meeting with a better inquiry, and Refined Bars are firm at \$2.25. The local mills will take no new orders at anything less than that figure, and though the stores are selling at the same price, yet an advance is inevitable if the present prices of the raw material are to be maintained. Norway and Swedish are unchanged at \$4.15 for Bars and \$5.15

for Shapes. Nails are dull, and there is some disposition on the part of sellers to cut prices again. The nominal quotation to the trade is \$2.90, but purchases can be made in some instances at \$2.85. The advancing tendency of Scrap Iron, however, seems to promise a stronger market for Nails. Copper continues slow of sale, but is firmly held at 19¼¢, spot, and 19½¢ for February and March delivery. The recent large sales filled up some of the principal consumers, and it is believed that the companies still have Copper on hand unsold. There has been no change in the combination prices of Manufactured Copper. We quote: New Sheathing Copper, 26¢; Braziers', 28¢, and Bolts, 28¢; Bottoms, 31¢; American Yellow Sheathing Metal, 17¢ @ 18¢; Yellow Metal Bolts, 20¢; and English Yellow Metal Sheathing, 14¢, in bond. **Lead**—The intimation in last week's Bulletin that this metal had touched bottom was speedily verified. Buyers have come in since our last and cleaned up all the low-priced lots, with the effect of sending quotations up to 5¢ a pound. Many operators, both here and in New York and St. Louis, intimate that they would rather sell than buy at to-day's rates, and say that the advance is due solely to the blowing up of the Lead works in New Jersey. But we know that 5¢ per lb. was offered for several thousand tons of Lead on Tuesday and refused. The prices of manufactures are unchanged, as follows: Bar, 6½¢; Pipe, 6½¢; Sheet, 7¢; Tin-lined Pipe, 15¢; Tin Pipe, 40¢; all less 10¢ to the trade. No. 1 Solder, 11½¢. **Spelter** is firm at 5¼¢ for Western and 5¢ for Refined. Retail lots command ¼¢ @ ½¢ above these figures. Sheet Zinc is quiet at 7¢ @ 7¼¢. Tin is off again in sympathy with a decline in London, consequent upon advances of large shipments thither from the East Indies. Straits can be purchased at 20¢. **Tin Plates** have met with a little more inquiry from large buyers, but are without any material change. **Commercial Bulletin.**

LOUISVILLE.

Messrs. GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of January 15: There has been no marked change in the market during the last week. The demand for Mill Irons has fallen off slightly and Foundry Irons are now looking up. Prices remain as per our last quotations, which are for cash, viz.:

FOUNDRY IRONS.
No. 1 Hanging Rock, Charcoal..... \$27.00 @ 28.00
No. 2..... 26.00 @ 27.00
No. 1 Southern, Charcoal..... 25.00 @ 26.00
No. 2..... 24.00 @ 25.00
No. 1 Hanging Rock, Stonecoal and Coke..... 23.50 @ 25.00
No. 2 Hanging Rock, Stonecoal and Coke..... 22.50 @ 23.50
No. 1 Southern, Stonecoal and Coke..... 22.00 @ 23.00
No. 2..... 21.00 @ 22.00
"American Scotch"..... 20.00 @ 21.00
Silver Gray..... 19.00 @ 20.00
Scotch..... 18.00 @ 19.00

MILL IRONS.
No. 1 Charcoal, Cold-short and Neutral..... \$22.00 @ 24.00
No. 1 Stonecoal and Coke, Cold-short and Neutral..... 21.50 @ 22.50
No. 2 Stonecoal and Coke, Cold-short and Neutral..... 20.50 @ 21.50
No. 1 Missouri and Indiana Red-short..... 20.00 @ 21.00
White and Mottled, Cold-short and Neutral..... 19.00 @ 20.00

CAR WHEEL AND MALLEABLE IRONS.
Hanging Rock, Cold-blast..... 35.00 @ 40.00
Alabama and Georgia, Cold-blast..... 35.00 @ 40.00
Kentucky, Cold-blast..... 35.00 @ 40.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of January 15: Trade for the past week has been more active, but still finds itself restricted by snow and ice, which have bound us in now for several weeks. Arctic temperatures prevail far south of us, and reports from Western Tennessee and Mississippi are discouraging. Cold and wet, long continued, caused the loss of a large part of the cotton crop of those districts, and we now hear complaints of the loss of sugar in Louisiana. Payments are not so prompt as they should be. Things would brighten materially if the weather would only turn off mild and dry for a time. Bar Iron is very firm. Nails are locally scarce, owing to the frozen river, with a prospect of being heavily in demand as soon as building can begin. A fire in the car works at Jeffersonville yesterday created much apprehension, but was extinguished with only the loss of the drying house. Damage, \$400.

ST. LOUIS.

Messrs. HOFFER, PLUMB & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, write us as follows, under date of January 15: The market has been quiet the past week, inquiries being less urgent. Prices remain nominally the same. Some brands are seeking market at low prices and with some urgency, owing, perhaps, more to the necessities of the makers than to the quality of the Iron, which is good:

ROT BAST CHARCOAL.
Missouri, No. 1..... \$26.00 @ 28.00
Southern, No. 1..... 24.00 @ 26.00
Hanging Rock..... 23.00 @ 25.00

COKE AND COAL.
Missouri..... 26.00 @ 27.00
Southern..... 24.00 @ 25.00
Ohio..... 24.00 @ 25.00

MILL IRONS.
Cold-short..... 21.50 @ 23.00
Red-short..... 20.00 @ 21.50

CAR WHEEL IRON.
Missouri..... 30.00 @ 33.00
Southern..... 28.00 @ 30.00
Ohio..... 25.00 @ 28.00

ORE.
For six, nominal..... 9.00 @ 12.00
For furnace..... 5.50 @ 7.50
Brown Hematites..... 4.00 @ 5.00

FOUNDRY IRONS.
Hanging Rock Charcoal No. 1..... \$29.00 @ 30.00
No. 2..... 28.00 @ 29.00
Coke and Stonecoal..... 25.00 @ 26.00
Hanging Rock Coke and Stonecoal..... 24.00 @ 25.00
Southern Charcoal and Coke No. 1..... 26.00 @ 27.00
Missouri..... 25.00 @ 26.00
Silver Gray..... 23.50 @ 25.00

MILL IRONS.
No. 1 Cold-Short and Neutral..... 22.50 @ 23.50
No. 1 Red-Short..... 24.00 @ 25.00

CAR WHEEL AND MALLEABLE IRONS.
Hanging Rock Cold Blast..... 40.00 @ 44.00
Worm Blast..... 35.00 @ 38.00
Lake Superior..... 35.00 @ 38.00
Southern..... 35.00 @ 40.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of January 17: Trade rules about the same as last reported, with prices firm:

Ref. Bar Iron, 1 to 6 by ¼ to 1..... \$2 ½ @ 2 ¾
" 1 to ¼ by ¼ to 1..... 2 ½ @ 2 ¾
" ¾ to 2, Round..... 2 ½ @ 2 ¾
" and Square..... 2 ½ @ 2 ¾
Hoop Iron, ¼ wide and upward..... 3 ½ @ 3 ¾
Band Iron, from ¼ to 4 in. wide..... 3 ½ @ 3 ¾
Horse-shoe Iron..... 3 ½ @ 4 ½
Norway Nail Rods..... 6 ½ @ 6 ¾
Black Diamond Cast Steel..... 13 ½ @ 14 ½
Machinery Steel..... 9 @ 9 ½
Cast Spring Steel..... 10 @ 10 ½
Common Horse Nails..... 10 @ 14 ½
Perkins' Horse shoes, ¾ keg of 100 lbs..... 4.37 ½
" Mule shoes..... 5.37 ½

Putnam Horse Nails..... 10 @ 8 7 6
Globe Horse Nails..... 10 @ 21 23 24 25
Railroad Spikes..... 3 @ 3 ¾
Less list discount to the trade.

R. C. HOFFMAN & Co., Iron and Commission Merchants, report the Pig Iron market as follows, under date of January 17: The Iron market continues firm, with a good demand for best brands. We quote:

Baltimore Charcoal Wheel Iron..... \$38.00 @ 40.00
Virginia C. B..... 38.00 @ 40.00
Anthracite No. 1..... 25.00 @ 26.00
No. 2..... 23.00 @ 24.00
No. 3..... 21.00 @ 22.00
" Mottled and White..... 18.00 @ 19.00
Charcoal C. B. Blooms..... 55.00 @ 60.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of January 17: Inquiries are numerous and the prospects promising. The market is firm at previous quotations, but sales confined to present needs:

Scotch Pig Iron..... \$24.00 @ 27.00
American Scotch Pig Iron..... 27.00 @ 29.00
No. 1..... 25.00 @ 26.00
No. 2..... 23.00 @ 24.00
No. 3..... 21.00 @ 22.00
Mottled and White..... 19.00 @ 21.00
Virginia Charcoal C. B. Wheel Iron..... 38.00 @ 41.00
Old Rails..... 30.00 @ 32.00
Old Wheels..... 28.00 @ 30.00
Wrought Scrap, No. 1..... 22.00 @ 23.00
Cast, Machinery Scrap..... 21.00 @ 22.00
Richmond Refined Bar Iron..... 34 @
Horse Shoes, Tredgear..... 4 @
Mule..... 5 @

CINCINNATI.

JANUARY 17.—Pig Iron.—The continued very cold weather has prevented many of the rolling mills and foundries in the West and South from resuming operations as early as usual in January, and the past week has been one of unusual quietness in the trade. Prices, however, are very firm and fully maintained at last week's quotations. Sales have been made at the following prices:

No. 1 Hanging Rock Charcoal, Hot-Blast Foundry..... \$26.00 @ 27.00
No. 1 Western and Southern Coke Foundry..... 23.00 @ 24.50
Bituminous Foundry..... 21.00 @ 22.00
Bituminous and Coke Gray Forge..... 20.00 @ 21.50
Cold Blast Charcoal Car Wheel Irons..... 38.00 @ 40.00
Warm Blast..... 28.00 @ 31.00
Bar Irons (firm)..... card rate, 2.15 @ 2.25

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., January 3, 1881.

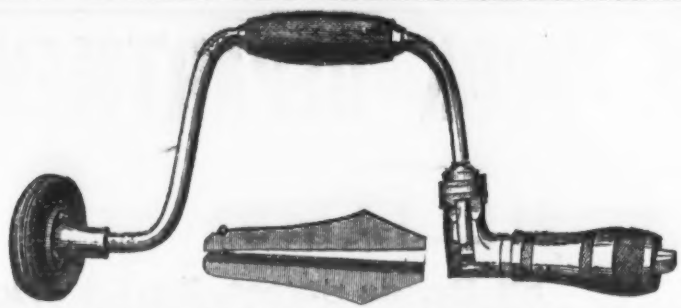
THE NEW YEAR.

opens auspiciously in almost the whole of the departments in which the readers of this journal are interested. The position at the moment is good, and there seems to be excellent reasons for assuming that prospects are sufficiently bright to warrant the expectation that an early upward movement will take effect. I have mixed a good deal among "iron men" during the holiday season which is now about at an end, and I am in a position to state that their opinions are almost unanimously in favor of rising prices and an extended activity of trade. This feeling is *per se* of good omen, inasmuch as it leads all parties concerned to act with renewed vigor, and favors movements of precaution and, possibly, of speculation, which will naturally have the tendency of furthering the expected revival. It is possible, I think, to trace the influence of Glasgow in much of this hopefulness, but it is also pretty certain that the market is sound, and that a really sound bottom has been reached. The speculators are, of course, highly elated with the reduction of stock shown by the Scotch ironmasters' returns for 1880, their fear having been that there would be an enormous increase instead of the decrease of 6000 tons actually set forth. At the same time, 739,000 tons in Scotland and above 250,000 tons in Cleveland, irrespective of the tonnage which almost certainly exists in other parts of the country, is an enormous aggregate reserve of crude iron with which to commence another year's operations, and it requires a fair proportion of courage and buoyancy to face the prospect (coupling with it a current output far in excess of the production of any former period) and to feel assured of a continued and marked improvement. Such a feeling and disposition, nevertheless, undoubtedly exist, the first fruits thereof being already apparent in the shape of an excited market at Glasgow and a sharp advance, amounting to about 2 per cent, in the price of warrants. This rise is probably a result of speculation pure and simple, on the part of new buyers and of those who find

it necessary to cover their old bargains, but its influence is widespread and its effects are as far reaching as though it had been caused by the most "legitimate" of reasons. The Cleveland market is following suit, and elsewhere throughout the iron-making centers the smelters are encouraged in their views, with a prompt firmness in quotations. It may be that the change may not prove lasting, although the probabilities appear to rule in favor of further increments. There is certainly a general idea that business is certain to be good this year, and the prevalence of the impression is almost sufficient to bring about the anticipated state of things. I think we must concede that the outlook possesses many strong features, and that any cool observer must be compelled to adopt optimistic views. With you matters seem to remain exceedingly good, and so far as our mail advice serves to show, you have the best of expectations for the spring trade. From many of our colonies reports are of a cheery tone, and some of the external markets—such as the West Indies, South America and the far East—are spoken of as being likely to yield a greater turnover than they have latterly shown. On the Continent matters have lately taken a most decided turn, particularly in France, where the iron and steel works are reported to be remarkably full of orders—some of them, indeed, being booked forward over the larger portion of this year. The Russian tariff, it is true, is not unlikely to prove an obstacle in the way of business with that empire, but, in the opinion of many well informed persons, it is believed that the Czar's subjects must still purchase their goods from external sources of supply, from sheer inability to manufacture themselves on a commercial scale and in a satisfactory manner. Otherwise Continental prospects are bright, and minus any serious drawback in the shape of political differences, save in the relatively unimportant cases of Turkey and Greece, which may well be left to settle their quarrel without causing any serious anxiety to the world at large. Turkey is a fair customer, but Greece is so utterly poor and insignificant a pretender to nationality that it is scarcely worth a second thought as a consuming market. At home, the condition of Ireland is certainly serious, and the insecurity of property and its owners is largely putting a stop to purchases by the tradesmen there. It would be impossible for the present lawlessness to continue, and there is every hope that the government will lose no time after the meeting of Parliament on January 6 in propounding their views as to the future and their remedies for the present state of affairs. Ireland is a good buyer of English manufactures, especially Dublin, Belfast and Cork, and a few other large towns, but in proportion to the size and population of the country it is by no means a large consumer. The poverty of the population of the West and Southwest, indeed, is so extreme and unmitigated that there is no money to spare, even for articles which are elsewhere counted among the common necessities of civilized existence. In other respects it is believed that the home trade has "got a turn," and that it is likely to show still further strength as the year grows older. The harvest money has been highly beneficial to the rural tradespeople, and they have put into circulation their receipts for the purpose of renewing their stocks, which are extremely low, even at the time being. I have the best of hopes in connection with the home market, but I am bound to confess that I do not anticipate great things from it during the first half of the year, for the simple reason that I believe the agriculturists to have only partially recovered from the effects of the disastrous losses which have for several years overtaken them. I should be glad to be found to be absolutely and entirely wrong, but as things stand I place the opinion on record, and leave the outcome to events. On the whole, then, I think we may assume that we have fairly, albeit not extravagantly, good prospects before us. It does not seem likely that we can rely upon our own consumers in the farming localities for a little time ahead, but with any pressure in the manufacturing towns there would speedily be a migration of labor thitherward which would denude the provinces of their surplus men, and so restore the balance of the consuming communities. This is a somewhat important point, and one which is not infrequently overlooked by writers and speakers. There is always a floating population, the constituent parts of which migrate to the towns when trade is brisk there, and are useful as laborers and the like, while in bad times they revert to the country districts, where they aid in impoverishing an already overstocked labor market. It is thus apparent that there may be a brisk home consumption, even in the teeth of agricultural depression, but it must come from the towns, and not from the farmers. I do not need to mention our best employed industries in detail in this place, inasmuch as in several of my recent letters I have touched upon such particulars as I have thought advisable for the general information of your readers. On the whole, it may be safely said that few years of late have opened so well as the present one, and that, with ordinary caution and prudence, we are almost certain to find in 1881 a period of assured and progressive prosperity.

SCOTCH PIG IRON

is firm and advancing, with a considerable amount of speculation on hand. Warrants have reached 53½, and may possibly go up still higher, in spite of the several checks which should tend to repress the ardor of those who are "in for a rise." There are now 495,850 tons in Connal's stores and 243,150 in makers' yards, a total of 739,000 tons. Just at the moment annual reviews and circulars are being issued in great numbers. They are much too long to be quoted at length here, but I have made a few selections which have an important or interesting bearing on the near future, as viewed in the light of the past. Messrs. John E. Swan & Bros., Limited, present a valuable series of statistics, compiled under the authority of the committee of the Ironmasters' Association. These figures show an increase of 18 in the average number of furnaces in blast in 1880; a make per week per furnace of 190 tons, against 204 tons in 1879 (owing to the strike, the average is reduced); an



Though we have occupied this identical space in *The Iron Age* for more than twelve years, and though we have been the leading Bit Brace manufacturers of this country during all that time, we have seldom spoken of it in our advertisement, for the reason that all the leading dealers were supposed to know it. Since we first put

THE BARBER IMPROVED BIT BRACE

on the market, at least a dozen patent braces have run their race through the stores and junk stores, and are now forgotten. It is true, some of them died violent deaths, but most of them perished from constitutional weakness. We do not offer to meet competition, as no one else can make our Brace, and we have nothing to compete with. Others might if they would make their braces of steel, but it is much more expensive, and no one can tell the difference until the brace is put into use. All of our Nickel-Plated Braces are made of rolled steel, with forged steel jaws, which will never wear out. We formerly made malleable iron jaws, which in time wore out. All such we will now replace with steel for 25 cents per pair. They are all one size and will always fit. Our Ratchet Brace at the present time has no competitor in the market. Dealers who sell other styles of braces will find it to their interest to buy their stock of ratchets from us.

The price of Barber Braces has not been changed for many years, and we do not anticipate any variation in the near future. Thanking our customers for past favors, we now solicit their future orders.

MILLERS FALLS CO.,

74 Chambers Street, New York.

HEATON & DENCKLA HARDWARE CO.,

Hardware Commission Merchants,

507 Commerce Street, Philadelphia.

E. & G. BROOKE'S "Anchor Brand" Nails, Brads, Spikes, &c.
MALLORY, WHEELER & CO.'S Door and Pad Locks.
UNION MANUFACTURING CO.'S Butts.
AMERICAN SCREW CO.'S Screws.
D. R. BARTON TOOL CO.'S Edge Tools, &c.
FRANCE'S Shutter Holders.
Anti-Window Rattlers, Brass and Nickel-Plated.
WESTERN FILE CO.'S Cast-Steel Files.
AMERICAN SHEAR CO.'S Shears and Scissors.
H. M. MYERS & CO.'S Shovels, Spades and Scoops.
STEELE & SONS' Wrought Handle Sad Irons.

EXCELSIOR MILLS. Genuine Turkish Emery.
BROWN & BRO.'S Brass and Copper Wire.
Rivets, Spoons, &c.
GAYLORD MANUFACTURING CO.'S Tins, Chest and Cupboard Locks.

AMES' Genuine Chester Emery.

COLWELL & COLLINS, NORWAY BOLT CO., Norway Carriage and Tire Bolts.
PLYMOUTH MILL CO.'S Black and Tinned Iron Rivets.
AMERICAN MACHINE CO.'S Flatirers, &c.
STUART PETERSON & CO.'S Tinned and Enamelled Ware, &c.
HUSSEY, HOWE & CO.'S Bar & Sheet Cast Steel.

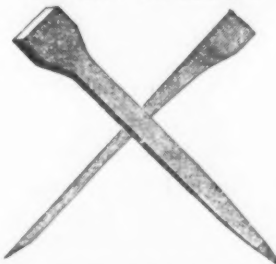
Also a large line of Heavy and Shelf Hardware.

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]



These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.

DURRIE & McCARTY, Agents,
No. 97 Chambers St., New York

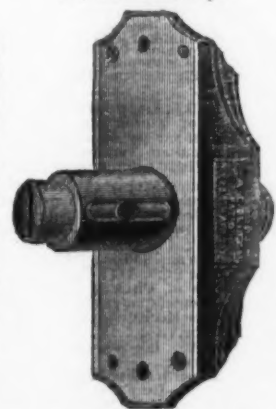
A. E. DEITZ,

(Successor to Barnes & Deitz.)

Manufacturer of

Store Door Locks, Night Latches, Padlocks, Drawer Locks, &c., with Flat Steel Keys.

EXTENSION TUBE



STORE DOOR LOCK, No. 184.

Durrie & McCarty, Agents,

97 Chambers & 81 Reade Sts., New York.

Established in 1839.

Formerly L. & A. G. Coes.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED

AND MECHANICAL



Patent Screw Wrenches

UNDER PATENTS DATED

MARCH 23, 1869,
REISSUED 1870.

NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Hand's
None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St. & 81 Reade St., N. Y.
DURRIE & McCARTY, Sole Agents.

The 1881 Pennsylvania Lawn Mower.

OUTSTRIPS ALL COMPETITORS.

PREMIUMS TAKEN OVER ALL OTHER MOWERS.

EVERY MACHINE WARRANTED TO WORK AS REPRESENTED.



Points Claimed as being Meritorious:

The lightest; runs more easily; cuts longer grass; requires less repairs; is more durable; cuts more smoothly; don't require sharpening once where others do half a dozen times.

1881 REDUCED PRICE LIST.

Width of Cutter, 10 inch.	Style of Driving Wheels, 8 inch.	Power required, A Child.	Weight, 30 lbs.	Price, \$11.00
12 "	8 "	A Lad.	35 "	15.00
14 "	8 "	A Lady.	36 "	17.00
16 "	8 "	One Man Size.	38 "	19.00
18 "	8 "		41 "	21.00

NEW MACHINES

For Cutting Long Grass

15 inch, 20 1/2 inch Driving Wheels, 6 1/2 inch.
Cylinder, Man Size, 48 lbs. \$20.00
17 inch, 20 1/2 inch Driving Wheels, 6 1/2 inch.
Cylinder, Man Size, 51 lbs. \$22.00

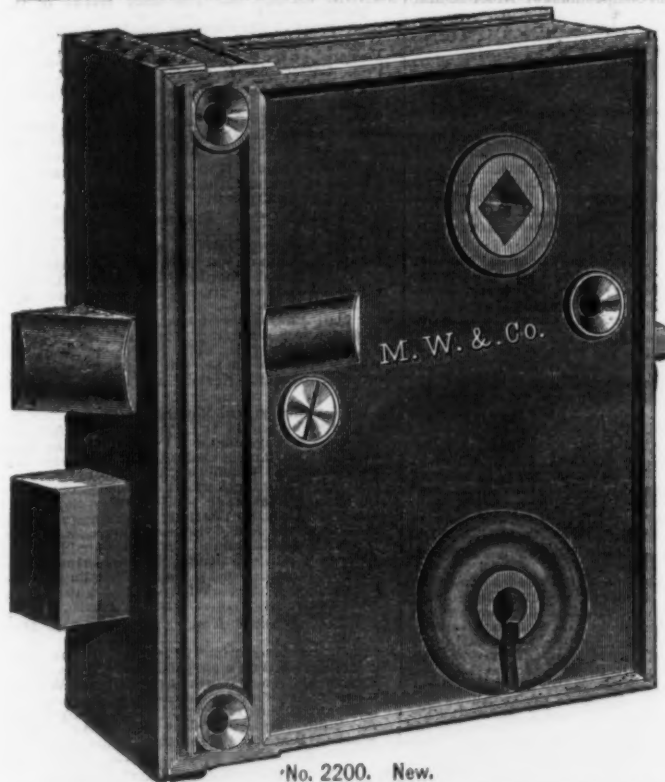
QUAKER CITY 10-INCH LAWN MOWER, - - List \$11.00

The QUAKER CITY guaranteed the best Mower for price manufactured.
Discount to the trade. Send for Descriptive Catalogue.

For Sale By

LOYD, SUPPLEE & WALTON, Philadelphia.
DURRIE & McCARTY, New York.
AMES FLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
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HAMILTON & MATTHEWS, Rochester, N. Y.
MARKLY, ALLING & CO., Chicago, Ill.

DUCHARME, FLETCHER & CO., Detroit, Mich.
LOCKWOOD, VANDORNE & TAYLOR, Cleveland.
WM. FRANKFURTH & CO., Milwaukee, Wis.
PRATT & CO., Elmira, N. Y.
LOYD & CLARKE, La Crosse, Wis.
G. L. FARWELL, St. Paul, Minn.
HART & CO., Louisville, Ky.



No. 2200. New.



MALLORY, WHEELER & CO.,

NEW HAVEN, CONN., U. S. A.,

Manufacture exclusively a large variety of

DOOR LOCKS, KNOBS, PADLOCKS, BRONZE DOOR FURNITURE, &c.

Gold Bronze Trimmings in NEW DESIGNS. No extra charge for our NEW IMPERIAL FINISH.

See samples of NEW LINE low priced Reversible Knob Locks, No. 2200, &c. with New Keys and variety of changes.

WAREHOUSES,

Where samples and a stock of our goods may be found and orders filled upon same terms as from the factory:

SARGENT & CO., No. 37 Chambers Street, New York.

HEATON & DENCKLA, No. 507 Commerce St., Philadelphia, Pa.

OTIS D. DANA, Nos. 22 to 32 Pearl Street, Boston, Mass.

JOHN R. KELSO, Jr., No. 23 S. Charles St., Baltimore, Md.

WHITE ANCHOR FIRE HOSE, FOR FIRE PROTECTION IN Manufacturing Establishments.

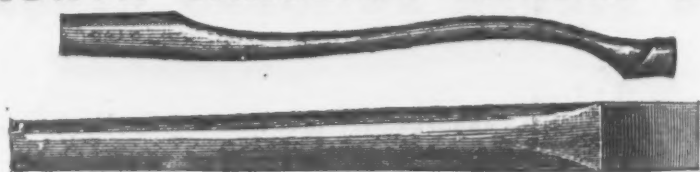
This Hose is in use in over 300 Fire Departments; weighs but 58 pounds to the section of 50 feet; will stand a pressure of 400 pounds to the square inch; guaranteed for three years; will retain its strength for many years. We have many testimonials showing continuous service for nine years, where the hose is in good condition for fire service.
For sample and price, address

AKRON RUBBER WORKS, Akron, Ohio.

HUNDLEY & HANKS,

PROPRIETORS OF

NORTH CAROLINA HANDLE CO.



MANUFACTURERS OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, NEW YORK.
HARDWARE COMMISSION MERCHANTS.

WALKER'S

Forged Horse Shoes,
SHOENBERGER'S

Patent Toe Calks,

Superior to any in market.

Send for prices and samples.

A. BUSSING, General Agent,
4 Warren St., New York.

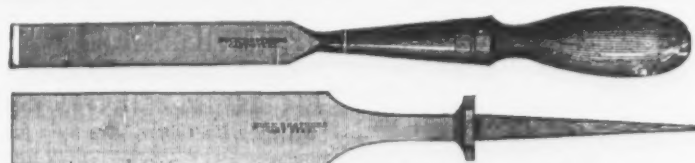
A. F. PIKE.

Pike Station, New Hampshire,
Manufacturer and Wholesale Dealer in

Bluestone

For Scythes, Axes, Knives and Turpentine Hacks.

Factories at Pike Station, N. H., and Evansville & Westmore, Vt.
Genuine Old Reliable, Indian Pond Red End, Premium Union, White Mountain, Leticia, Hacker, Hampden Vint, The New Boss, Lamoille, Hagg, Willoughby Lake, Green Mountain, Black Diamond, Waring Machine, German Pattern, Chocolate, Ax Bits, Stones made, labeled and branded in any style desired. Price and QUALITY GUARANTEED. All the above brands are of clear, & no grit and will not glaze.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of

Shank, Socket Firmer and Socket Framing Chisels,

PLANE IRONS.

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark, also "Liverlin Works."

W. K. ROSS,

97 CHAMBERS ST., NEW YORK.

SCYTHES & SNATHS,
FORKS, HOES & RAKES
FOR EXPORT.

The Cotton Manufactures of the Country.

The following is a preliminary report to the Census Bureau upon the specific cotton manufacture of the United States, exhibiting the number of looms and spindles, the number of bales of cotton consumed, and the number of operatives employed, as reported by Edward Atkinson, of Boston, Mass., special agent of the tenth census in cotton manufacture:

States.	No. looms.	No. spindles.	No. bales cotton used.	Persons employed.
Alabama.....	1,060	55,072	14,887	1,600
Arkansas.....	28	9,018	290	64
Connecticut.....	18,035	931,538	107,877	15,497
Delaware.....	823	48,858	7,512	695
Florida.....	...	816	850	30
Georgia.....	4,713	200,974	67,874	6,678
Illinois.....	24	4,860	2,201	281
Indiana.....	776	33,306	11,558	730
Kentucky.....	73	9,032	4,215	359
Louisiana.....	120	6,005	1,354	108
Maine.....	15,978	606,081	112,361	13,310
Maryland.....	8,385	125,014	46,947	4,150
Massachusetts.....	94,788	4,465,790	578,590	62,794
Michigan.....	131	12,120	600	908
Mississippi.....	754	15,172	6,391	745
Missouri.....	341	20,312	6,391	515
New Hampshire.....	25,487	1,008,521	172,746	16,857
New Jersey.....	3,344	231,305	80,569	4,615
New York.....	12,822	577,512	78,014	10,710
North Carolina.....	1,050	100,767	37,508	3,448
Ohio.....	49	24,320	10,597	163
Pennsylvania.....	10,541	446,379	86,355	11,871
Rhode Island.....	30,274	1,649,201	261,694	22,228
South Carolina.....	1,776	92,755	33,090	2,191
Tennessee.....	1,068	46,508	11,699	1,312
Texas.....	71	2,648	446	71
Utah.....	74	437	...	90
Vermont.....	1,500	55,088	7,404	735
Virginia.....	1,394	44,336	14,401	1,112
Wisconsin.....	400	10,249	3,773	283
The United States.....	230,213	10,921,147	1,586,481	187,658

The above does not include the hosiery mills, or any of the woolen mills known as woolen mills where cotton may be a component material used in the manufacture.

In the case of the recent boiler explosion at Allentown, Pa., by which 13 lives were lost, the coroner's jury was unable to form any opinion as to the cause of the accident, and so declared in their verdict. Two days before, a committee of the Keystone Council of Engineers on the Allentown explosion made their report, showing that the boiler gave way at its weakest part, where its own weight might have broken it down at any time. The explosion was due, among other causes, to faulty construction, unskillful repairing, bad management and neglect. No cause is leveled against any one, but those responsible are left to the logic of facts. If the coroner's jury had worked on this information they might have found that somebody was open to mild reproof.

RIEHLE BROS.

SCALES AND Testing Machines
All Varieties.
Send for prices.
50 South 4th St.,
Philadelphia.
Under 7th Ave. Hotel,
Pittsburgh.

BAILEY ELEVATOR

AND PORTABLE HOIST.
Warranted double the power and not one-half the price of other hoists. As a proof of the above I will give them 30 days on trial. Send for catalogue and price list. Address,
J. DUNN, 32 Bank Street, CLEVELAND, OHIO.

COMBINATION STEEL & IRON CO.,

CHESTER, PA.
We are now prepared to manufacture the COMBINATION RAILS under Wheeler's patent. Orders solicited.

New York Office, 82 JOHN ST.
C. A. WOOD, General Manager.

ROLLING MILL CRAYONS.

More convenient and cheaper than either common or French chalk. For manufacturers of all sheet metals, metal workers, machinists, blacksmiths, &c. Send for sample and price list.

D. M. STEWARD,
Sole Manufacturer,
231 State Avenue, Cincinnati, Ohio.

A Revolution in Boat Building.

THOMAS KANE & CO., Chicago, Ill.
Successors to KANE BOAT CO.

J. STEVENS & CO.,

Chicopee Falls, Mass., P. O. Box 224.
Manufacturers of

Spring Calipers and Dividers.

Also, Surface Gauges and Counter Sinks, Stevens' Patent Breech-Loading Sporting Rifles, double and single barrel; Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet Rifles. Our

SHOOTING GALLERY RIFLE

Is the favorite everywhere.

SAFE From DESTRUCTIVE EXPLOSION.

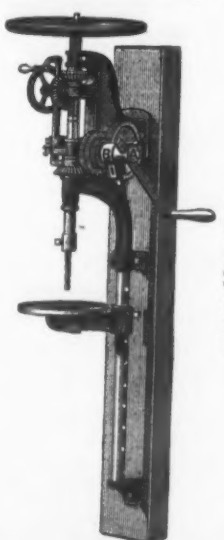
25,000 Horse Power in Use.
SEND FOR PAMPHLET TO
HARRISON BOILER WORKS,
15th and Buttonwood Streets,
PHILADELPHIA.

GEORGE C. TAFT,

Worcester, Mass., U. S. A.,
Manufacturer of

Improved Upright and Horizontal Self-Feed Drills,

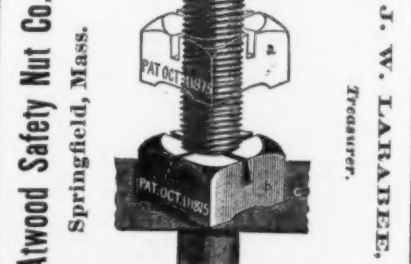
For Blacksmiths' and Carriage Makers' Use.



Illustrated circulars giving descriptions of my several self-feed drills, sent on application.

This cut represents my No. 2 Improved Drill, double geared, so arranged that by moving the crank from A to B it will give a slow motion for heavy drilling to the drill spindle.

Atwood Safety Nut Co.,
Springfield, Mass.



A. Atwood Nut on bolt without bearing on base—screw open. B. Atwood Nut turned to bearing c. partially closing the slots and grasping the bolt.

B. F. Mercer,

Manufacturer of

Wood Pumps

Plain and Porcelain Lined,
FOR STOCK WELLS,
HOUSE WELLS
& CISTERNS.
Send for Price List.

B. F. Mercer,

Alliance, O.

NEWCASTLE GRINDSTONES

(ENGLAND).
Celebrated for their uniform quality and keen rasping grit, have now a world-wide reputation.
For prices apply to
R. ATKINSON & CO.,
Manufacturers,
Office, Guildhall, Newcastle-on-Tyne.

THE HARTFORD HAMMER CO.

Manufacturers of

Solid Cast-Steel Hammers

Under H. Hammond's Patent Process.
HARTFORD, - CONN., U. S. A.

The Morris Sash Lock Mfg. Co.,

Manufacturers of

The Morris Sash Lock,

Pat. Combined Sash Lift & Lock,
Pat. Self Locking Shutter Bar,
And specialties in Builders' Hardware.
214 and 216 ELM STREET, CINCINNATI, OHIO, U. S. A.

POWERSVILLE ROLLING MILL,

Manufacturer of

HORSE SHOE IRON

JOHN LEONARD, 450 West St., N. Y.

THE IRON AGE BOOK DEPARTMENT.

DAVID WILLIAMS,

83 Reade Street, New York.

Any Book published in this country will be mailed, postpaid, at publishers' prices, to any address in the United States or Canada.

Foreign Books will be mailed, postpaid, at importers' prices, to any address in the United States or Canada.

Orders and inquiries by mail will receive careful and prompt attention.

LIST OF TECHNICAL BOOKS SPECIALLY SELECTED FOR THE DIFFERENT INDUSTRIES.

- BAYLES, JAMES C.**—House Drainage and Water Service in Cities, Villages and Rural Neighborhoods. Large 8vo, 366 pages, illustrated with 30 wood cuts and 3 folded plates. A practical work of value to the building trades and all interested in the mechanics of hygiene. Price, \$3.00.
- CHAPTER I.**—Hygiene and its Practical Relations to Health.
II.—Sewerage.
III.—Water and Soil Pipes.
IV.—Traps and Seals, and the Ventilation of Waste Pipes.
V.—Water Closets.
VI.—Service Pipes and Water Service in City Houses.
VII.—Tanks and Cisterns.
VIII.—The Chemistry of Plumbing.
IX.—Elementary Hydraulics Applicable to Plumbing Work.
X.—Sanitary Construction and Drainage of Country Houses.
XI.—Water Supply in Country Districts.
XII.—Suggestions Concerning the Sanitary Effect of Drainage.
XIII.—The Plumber and His Work. Price, \$3.00.
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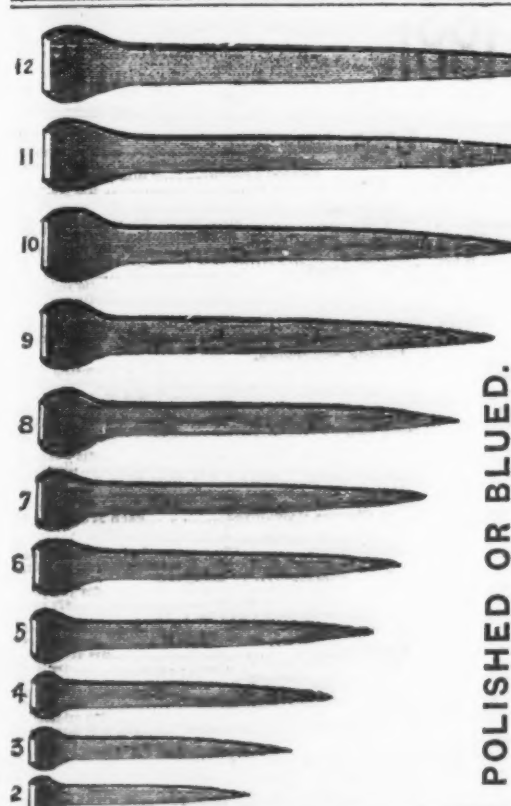
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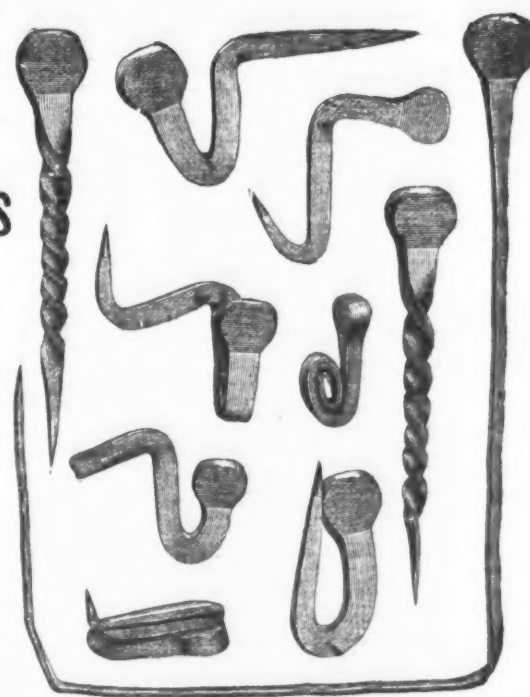
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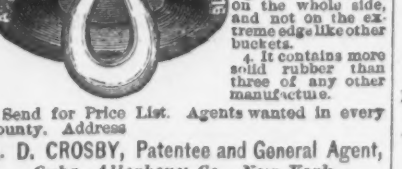
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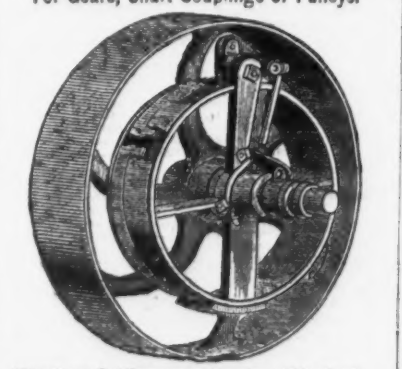
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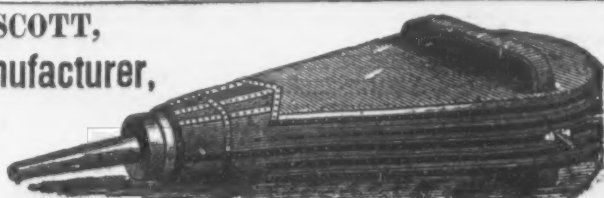
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SECOND QUALITY

NOTICE.

Hereafter our GALVANIZED SHEET IRON will be branded as per cuts in margin. We have adapted these

TRADE MARKS

to protect ourselves and the trade against imitations of our iron, as was the case under our old brands.

MOORHEAD & CO.

January 1, 1881.

THIRD QUALITY
as heretofore,
REFINED.

C. P. MOORMAN, Pres. J. MORGAN COLEMAN, V. Pres. L. G. QUIGLEY, Sec. and Treas.

COLEMAN ROLLING MILL CO.,

Lessees Louisville Rolling Mill,

MANUFACTURERS OF



T and Tram Railroad Iron, 10 lbs. to 40 lbs. per yard, and
DEAN & COLEMAN PATENT RAIL.
Office, No. 45 W. Main St., Mill Brook St.,
LOUISVILLE, KY.

BELLAIRE NAIL WORKS,

PIC IRON AND NAILS,

Manufacture the Celebrated Brand of

BELLAIRE NAILS,

Office and Works, **Bellaire, Ohio.**

Philadelphia Smelting Co.,

S. E. Cor. Twelfth and Noble Sts., PHILADELPHIA.

GENUINE BABBITT,

Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

DEOXIDIZED BRONZE,

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

PHILADELPHIA SMELTING COMPANY, CHY.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.
Very truly,
HARRY DISTON & SONS.

WIRE NAILS

French Points, Window Shade Nails,
Upholstering, **WAGON NAILS,** Molding Nails,
(Sample Cards sent on application.)
Electrotype, Roofing Nails,
Barbed Caster Nails.

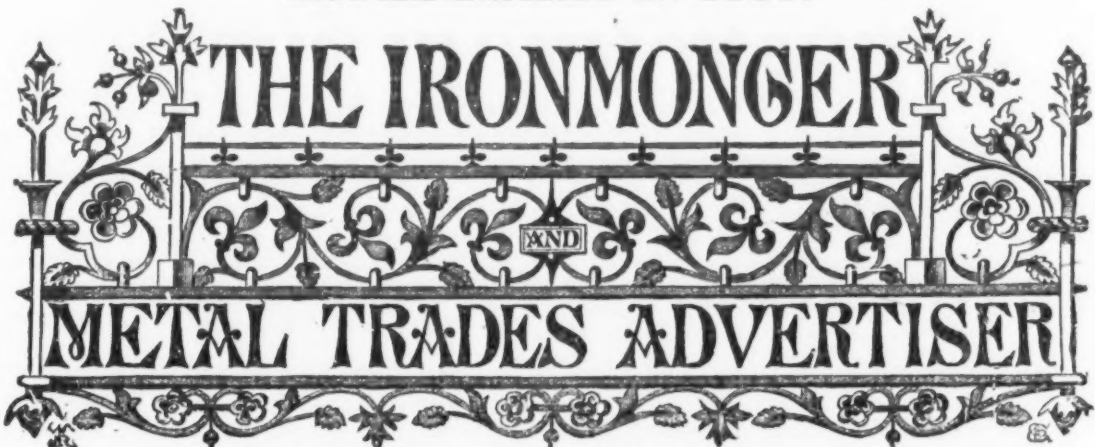
Vener Nails, Label Tacks and small Nails of all kinds, Cabinet Nails, Barbed Lock Nails, Cigar Box Nails, &c., &c., put up in bulk, 5 lb. packages, 1 lb. papers, or as wanted.

AMERICAN WIRE NAIL CO.

Factory, Fifteenth and Madison Sts.

COVINGTON, KY.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

NEW YORK OFFICE: DAVID WILLIAMS, Publisher of *The Iron Age*, 83 Reade street.

PITTSBURGH OFFICE: 77 Fourth Avenue—JOS. D. WEEKS, Manager and Associate Editor.
PHILADELPHIA OFFICE: 220 South Fourth Street—THOMAS HOBSON, Manager.

CINCINNATI OFFICE: Builders' Exchange—T. T. MOORE, Manager.
SOUTHERN OFFICE: Cor. Eighth and Market Streets, Chattanooga, Tenn.—S. B. LOWE, Manager.

SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.
Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. *The Week*, *Legal News*, *Trade Notes*, *Bankruptcies*, *Foreign Notes*, *Colonial Notes*, *Merchants' Circulars*, &c., are each departments of the journal, containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French Belgian and other Special Correspondence.

SUBSCRIPTIONS

to the *Ironmonger* and *Metal Trades Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to actual subscribers at 75 cents.

ADVERTISEMENTS

are inserted in the *Ironmonger* and *Metal Trades Advertiser* at the subjoined rates, from which no variation can be made on any ground whatever:

Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in the *Ironmongers' Diary and Text Book*, published toward the end of each year, and presented to every Subscriber.

	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	1 INSERTION, net.
One page.....	Gold. \$20.00	Gold. \$22.50	Gold. \$25.00	Gold. \$30.00	Gold. \$35.00	Gold. \$50.00
Two-thirds page.....	15.00	16.90	18.75	22.50	26.25	37.50
Half page.....	11.00	12.40	13.75	16.50	19.25	27.50
One-third page.....	8.00	9.00	10.00	12.00	14.00	20.00
Quarter page.....	6.40	7.25	8.00	9.60	11.20	16.00
One-sixth page.....	4.50	5.10	5.65	6.75	7.75	11.30
One-eighth page.....	3.60	4.10	4.50	5.40	6.25	9.00
One-sixteenth page.....	2.00	2.25	2.50	3.00	3.50	5.00

SPECIAL ISSUES.

In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than Twelve Thousand (12,000) copies.

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual presented free to every Subscriber to the *IRONMONGER AND METAL TRADES ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:
FEBRUARY 1, MARCH 5, APRIL 9 and 30, MAY 23, JUNE 25, JULY 23, AUGUST 27, SEPTEMBER 17, OCTOBER 4, NOVEMBER 5, DECEMBER 3 and 31.

This Supplement is published in

FIVE LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish-speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

Advertisements are inserted in any language at the following

MODERATE TARIFF.

Size of Page—13½ Inches Deep by 9½ Inches wide.

	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.		13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
One page.....	Gold. \$30.00	Gold. \$33.75	Gold. \$37.50	Quarter page.....	\$10.00	\$11.25	\$12.50
Two-thirds page.....	22.00	24.75	27.50	One-sixth page.....	7.50	8.45	9.40
Half page.....	17.00	19.15	21.25	One-eighth page.....	6.20	7.00	7.75
One-third page.....	12.50	14.10	15.65	One-sixteenth page.....	3.20	3.40	4.00

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language, can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List of Advertisements must be inserted in the *Ironmonger* and *Foreign Supplement* is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

B. KREISCHER & SONS, FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK And Furnace Blocks DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,
Twenty-third Street,
Above Race, PHILADELPHIA.
Twenty years' practical Experience.

PERTH AMBOY TERRA COTTA CO.,

Successors to

A. HALL & SONS, Perth Amboy, N. J.,
ARCHITECTURAL TERRA COTTA

FIRE BRICK.

170 Broadway, NEW YORK.

BROOKLYN

Clay Retort and Fire Brick Works,
(EDWARD D. WHITE & CO.)Manufacturers of Clay Retorts, Fire Brick,
Gas House and other Tile.VAN DYKE, EL ZABETH, RICHARDS & PARTITION STS.
Office, 88 Van Dyke St., Brooklyn, N. Y.

WATSON FIRE BRICK CO.,

ESTABLISHED 1856

cessors to JOHN R. WATSON, Perth Amboy, New Jersey.
Manufacturers of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
and Grate Setting, Glass Works, &c.
Fire Clays, Fire Sand, and Knobs for Sale.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,

Manufacturer of FIRE BRICK, HOLLOW

BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot, 418 to 422 East 23d St., N. Y.

TROY FIRE BRICK WORKS,

Troy, N. Y.,

JAMES OSTLANDER & SON,

ESTABLISHED 1858

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Furnace Blocks, &c. Mines and
Dealers in Woodbridge Fire Clay and Sand, and Slated
Island Knobs.

Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK,
TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and
Miners and Shippers of Fire Clay.Office: 116 Smithfield St., Pittsburgh, Pa.
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y.

GEO. H. CREED,

SHIP CHANDLERY,

103 Bunde Street, New York.

Manufacturers of and Wholesale Dealers in

Cotton and "Long Flax" Sail Duck,
Cotton and Lincen Havens,Creed's Patent Ship's Clews, Holtzman's Wire Rope
Splices, Agents for Raymond's American Crane Oil
for lubricating Cylinders and Valves.

WILLIAM H. ASKEY, Chairman. PETER D. WANNER, Sec. and Treas.

Mellert Foundry & Machine Co.,

Limited.

(Works Established at Reading, Pa., in 1828.)

Manufacturers of

Specials, Flange Pipe Retorts, Valves and Hydrants,
Lamp Posts, &c. The Improved Canadian Trench
Water Wheel Machinery and Castings
for Furnaces, Rolling Mills, Grist and Saw Mills, Mining
Pumps, Hoists, &c. Columns, Brackets, Iron
Railings, &c.

ARNOLD MELLERT, Supt., Reading, Pa.

HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

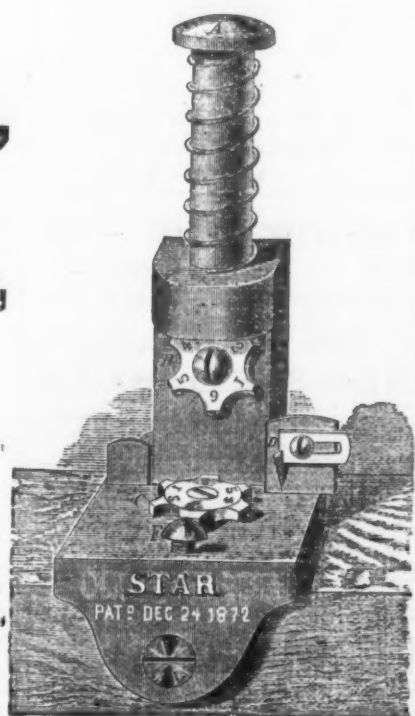
Front and Laurel Streets,

PHILADELPHIA.

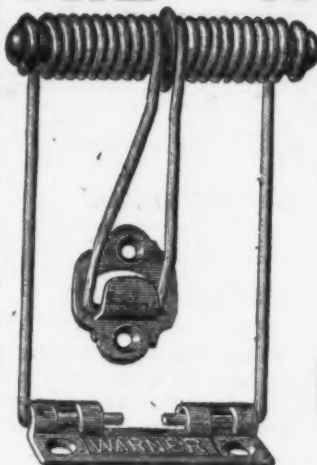
The cut shown herewith represents our

STAR SAW SET,

which is unequalled for simplicity, durability and accuracy in

Setting all kinds of Hand Saws, Web Saws,
Wood Saws, Back Saws.We guarantee this tool to do the work for which it is in-
tended, if properly used; if it does not, the money will be re-
funded and the tool can be returned at our expense.We have long felt the need of a Saw Set that would set
the teeth of a saw without breaking, and at the same time can
be worked by anybody.In the Star Set the same principle is involved as is used in
our works for setting saws.

THE "WARNER" DOOR SPRINGS

are the most simple, most effective and most convenient ever introduced, and the immense sale we
are having shows their great popularity and superiority.There never was a Spring made that is so durable, so complete in its action, operating with a
uniform pressure, holding the door tight when closed, and allowing it to open without increasing
the pressure at any point.

When the door is opened about 130 degrees of a circle, it will press and hold it open.

The Spring is easily unhooked and rehooked—in an instant—from the door and also
from the jamb, without removing a screw or pin.

This is a Convenience Possessed by no other Spring in the Market.

We are making this season three sizes, viz:

No. 1 For Screen or Light Storm Doors.

No. 2 For Medium Doors.

No. 3 For Heavy Doors.

They are for sale by most of the prominent jobbers of the United States and Canada.

Correspondence solicited.

FREDERIC BARTLETT,

FREEPORT, ILLINOIS.

CHAMPION ONE-MAN SAW

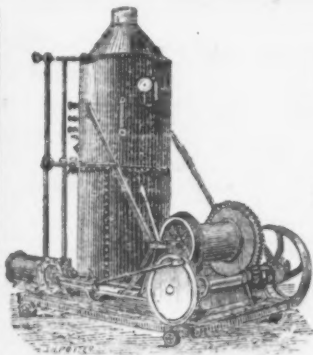
WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw.
We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.



NEW MAKE OF MINE LAMP.

THREE DIFFERENT SIZES. SEAMLESS BRASS COLLAR. BRASS HINGE. Solid Lid. NO SOLDERING. THE HINGE CANNOT MEET. LEONARD BROS., Scranton, Pa.



A. J. DAVIS & CO., Patent Friction Hoisting Engines

For Mines, Quarries, Dock Building, &c.

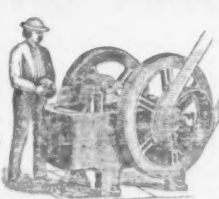
MANUFACTURERS OF

SHAPERS, DRAIN PIPE MACHINES, BAG AND
SATCHEL MACHINERY,Steam Engines, Wire Drawing
Machinery, &c., &c.

69 N. J. R. Avenue, Newark, N. J.

Correspondence solicited.

The Farrel Foundry and Machine Co.



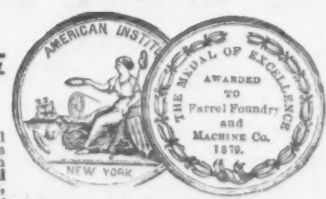
View of Rock Breaker.

ANSONIA, CONN.,

Manufacture Improved

ROCK & ORE BREAKERS,

(The "BLAKE" STYLE)

designed for breaking to small
pieces and one-third dust all kinds
of hard and brittle substances, such
as Quartz, Emery, Gold and
Silver Ores, Coal, Plaster,
Iron, Copper and Lead Ores;
also, Stone for making Concrete
and Railroad Ballast.
Twenty years of practical test, at home and abroad, has proven this machine to be the best one
ever invented for the purpose. Mr. S. L. BLAKE, for the past fifteen years connected with the manufacture
of these machines, has charge of this department of our works, and will personally supervise their erec-
tion within a reasonable time. Chilled Rolls and Rolling Mill Machinery; Power Presses, single
and double acting; also, Hammers, Drops and Lifters; Shafting, Pulleys and Hangers.Premium of Excellence, American
Institute Fair, 1879.

John T. Lewis & Bros.

No. 281 South Front St.,
PHILADELPHIA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

Brooklyn White Lead Co.



TRADE MARK

White Lead, Red Lead & Litharge.
No. 182 Front Street,
NEW YORK.

JOHN JEWETT & SONS,

Manufacturers of the well-known brand of

WHITE LEAD.



TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.



TRADE MARK.

The Atlantic White Lead
and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead,
Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York.



DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs
of every description, from best Cast Steel

BRISTOL, CONN.

"VALENTINE'S" PATENT FELT WEATHER STRIP.

For keeping out Cold, Wind and Dust. The best,
most durable and cheapest strip in the market. It is
not affected by the weather, does not become hard
and brittle in cold or melt in warm weather. Sam-
ples and Price List sent free by mail.W. T. VALENTINE,
Sole Manufacturer and Patentee, Albany, N. Y.THOMAS MORTON,
65 Elizabeth Street, New York,
Manufacturers of Copper and Iron

SASH CHAINS,

With Patent Attachments.

Warranted for years. Chains of any size made to
order, and trade supplied with liberal discount.

PHILADELPHIA.

(Corrected Weekly by Lloyd, Supple & Walton.)

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Amvils.
Peter Wrights, # 10.....10.00
Over 20 lbs.....11.00
Eagle (American).....10.00 # 10-15 20

Apple Parers.
Keystone Centennial, 1876.....1.00
Reading No. 72.....1.00
No. 74.....1.00
No. 75.....1.00
Rotary Peck Parers.....1.00
Lots of 10 to 24 dozen special prices

Axes.
Hunt's Kentucky and Tanke.....per doz \$11.00
Mann's Red Warrior.....11.00
Mohlman Chief.....10.00
Severed Axes.....10.00
Double Bit Axes.....22.00

Augers and Auger Bits.—New List January 1.
Bates' Nut Augers.....dis 20
Coo's Augers.....dis 20
Watrous Ship Augers.....dis 18
Benjamin Pierce Auger Bits.....dis 18
Griswold Auger Bits.....dis 18
Coo's.....dis 18
Jennings' Pat. Hol. Augers, list \$10 doz.....dis 20
Stearns' Pat. Hol. Augers, list \$10 doz.....dis 20
Balances.....dis 18 to 24

Bells.
Berlin Bros. Mfg. Co. Light Hand Bells.....dis 60 to 80
Swiss Pattern Hand Bells.....dis 60 to 80
Connell's Door Bells.....dis 60 to 80
Gt. Western & Kentucky Cow, new list.....dis 50
Belt and Rivet.....dis 50
Chambers' No. 1, for 1/2 bolt.....each \$7.50
No. 2, 1 1/2.....9.00 dis 15
No. 3, 2.....12.00

Spring Machines.
Upright, without Augers.....List 5.00 dis 40
Angular, without Augers.....6.75

Bolts.—Eastern Carriage Bolts.....dis 20 to 24
Philadelphia.....dis 20 to 24
Stanley, Wrought Shutter.....dis 20 to 24

Braces.—Barber's.....dis 20 to 24
Backs.....dis 20 to 24
Rochford.....dis 20 to 24
American Ball.....dis 20 to 24

Butts.—Cast Fast Joint, Narrow.....dis 20 to 24
Broad.....dis 20 to 24
Cast Loose Joint, Narrow.....dis 20 to 24
Broad.....dis 20 to 24
Acorn Loose Pin.....dis 20 to 24
Mayer's Loose Joint.....dis 20 to 24
Wrought Loose Pin.....dis 20 to 24
Table Hinges and Back Caps.....dis 20 to 24
Narrow Fast.....dis 20 to 24
Loose Joint.....dis 20 to 24

Filled Butts.
Parker.....dis 20 to 24
Clark.....dis 20 to 24
Shepard.....dis 20 to 24
Lull & Porter.....dis 20 to 24
Huffer's.....dis 20 to 24

Chains.—German Ralter and Coll. new list Oct. 22.....dis 20 to 24
Galvanized Chain.....dis 20 to 24
Best Proof Coil Chain.....dis 20 to 24
No. 1.....dis 20 to 24
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PITTSBURGH.

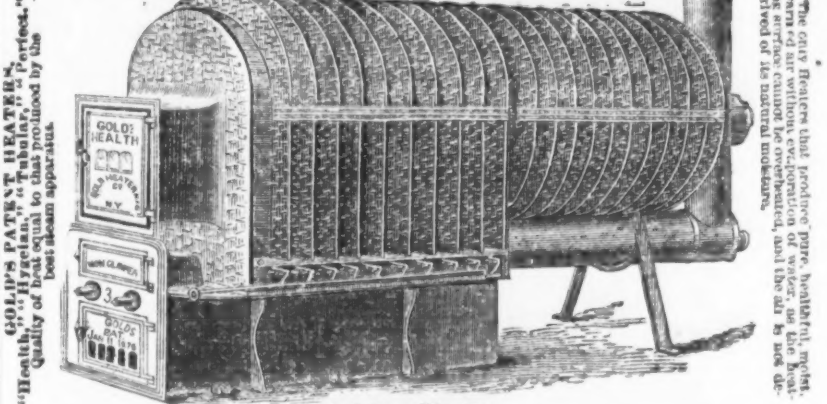
Merchant Iron.
Terms.—Note or acceptance at 60 days, with current rate of exchange on New York, or cash, 10 days from date of invoice.

Flat Bar.
1 1/2 to 4 by 1/2 to 1 inch.....dis 20 to 24
4 to 6 by 1/2 to 1 inch.....dis 20 to 24
6 to 8 by 1/2 to 1 inch.....dis 20 to 24
8 to 10 by 1/2 to 1 inch.....dis 20 to 24
10 to 12 by 1/2 to 1 inch.....dis 20 to 24
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86 to 88 by 1/2 to 1 inch.....dis 20 to 24
88 to 90 by 1/2 to 1 inch.....dis 20 to 24
90 to 92 by 1/2 to 1 inch.....dis 20 to 24
92 to 94 by 1/2 to 1 inch.....dis 20 to 24
94 to 96 by 1/2 to 1 inch.....dis 20 to 24
96 to 98 by 1/2 to 1 inch.....dis 20 to 24
98 to 100 by 1/2 to 1 inch.....dis 20 to 24

Nails.

Best Quality Halfed Cast Steel.
Square, Flat, Octagon and Round.
1/2 to 2 inches, inclusive.....dis 10 to 12
2 to 3 inches.....dis 10 to 12
3 to 4 inches.....dis 10 to 12
4 to 5 inches.....dis 10 to 12
5 to 6 inches.....dis 10 to 12
6 to 7 inches.....dis 10 to 12
7 to 8 inches.....dis 10 to 12
8 to 9 inches.....dis 10 to 12
9 to 10 inches.....dis 10 to 12
10 to 12 inches.....dis 10 to 12
12 to 14 inches.....dis 10 to 12
14 to 16 inches.....dis 10 to 12
16 to 18 inches.....dis 10 to 12
18 to 20 inches.....dis 10 to 12
20 to 22 inches.....dis 10 to 12
22 to 24 inches.....dis 10 to 12
24 to 26 inches.....dis 10 to 12
26 to 28 inches.....dis 10 to 12
28 to 30 inches.....dis 10 to 12
30 to 32 inches.....dis 10 to 12
32 to 34 inches.....dis 10 to 12
34 to 36 inches.....dis 10 to 12
36 to 38 inches.....dis 10 to 12
38 to 40 inches.....dis 10 to 12
40 to 42 inches.....dis 10 to 12
42 to 44 inches.....dis 10 to 12
44 to 46 inches.....dis 10 to 12
46 to 48 inches.....dis 10 to 12
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52 to 54 inches.....dis 10 to 12
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64 to 66 inches.....dis 10 to 12
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68 to 70 inches.....dis 10 to 12
70 to 72 inches.....dis 10 to 12
72 to 74 inches.....dis 10 to 12
74 to 76 inches.....dis 10 to 12
76 to 78 inches.....dis 10 to 12
78 to 80 inches.....dis 10 to 12
80 to 82 inches.....dis 10 to 12
82 to 84 inches.....dis 10 to 12
84 to 86 inches.....dis 10 to 12
86 to 88 inches.....dis 10 to 12
88 to 90 inches.....dis 10 to 12
90 to 92 inches.....dis 10 to 12
92 to 94 inches.....dis 10 to 12
94 to 96 inches.....dis 10 to 12
96 to 98 inches.....dis 10 to 12
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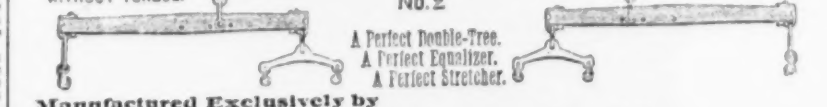


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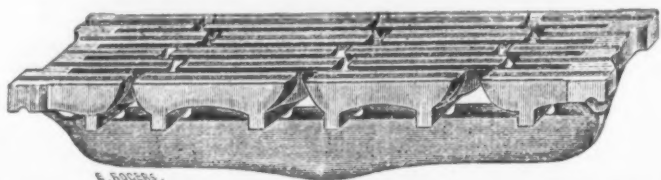
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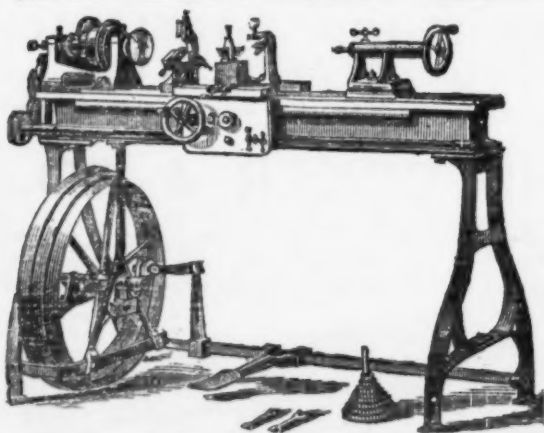
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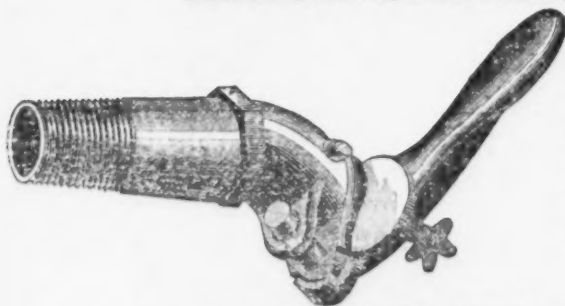
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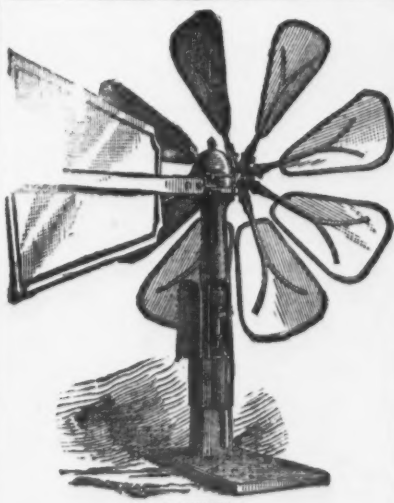
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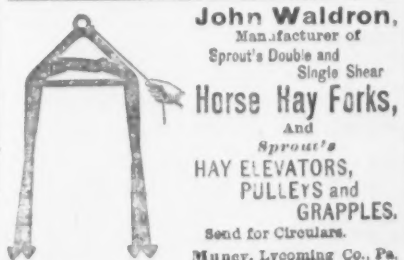
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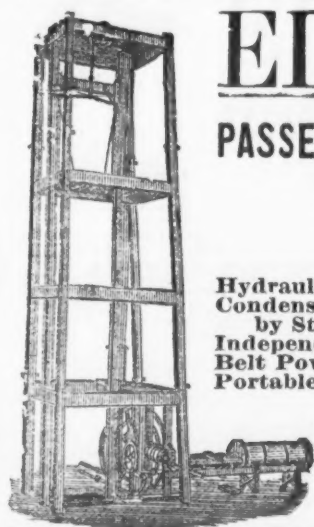
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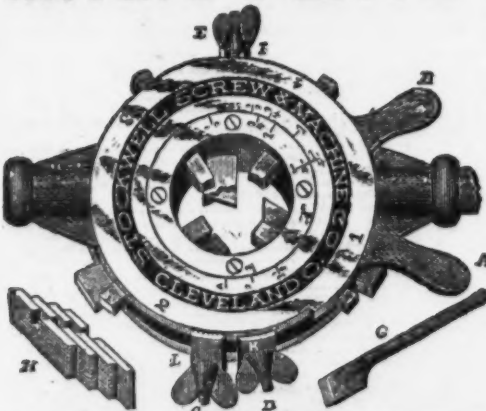
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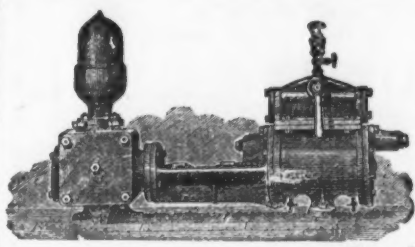
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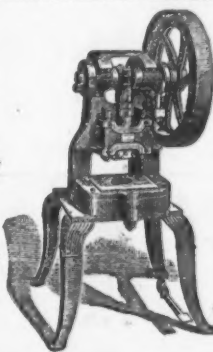
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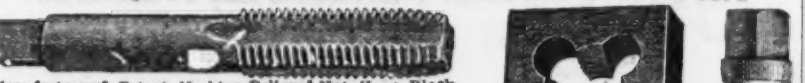
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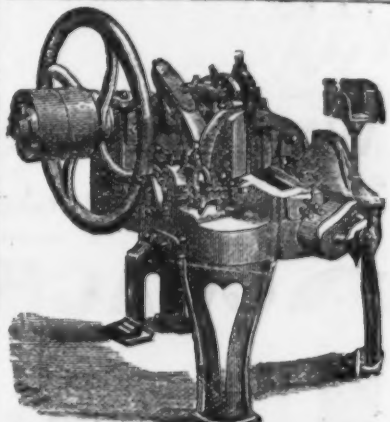
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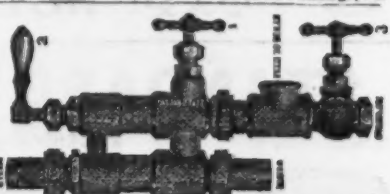
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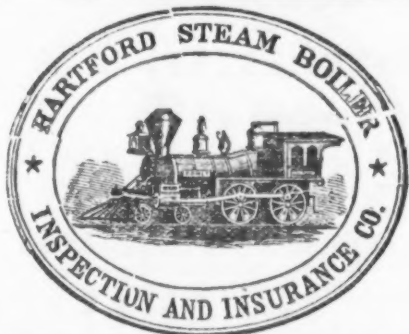
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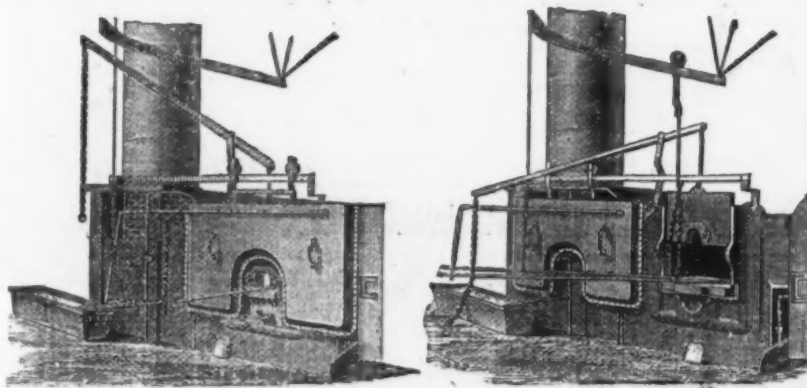
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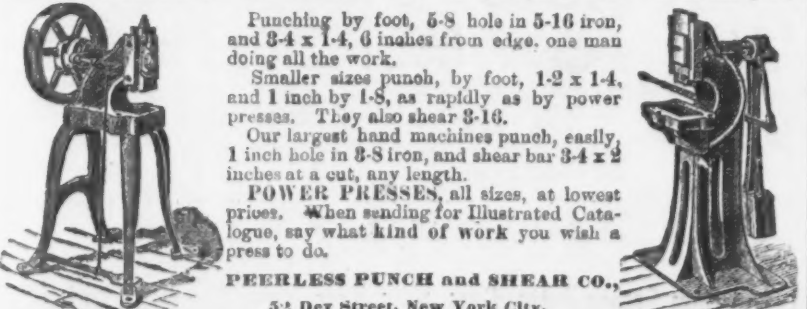
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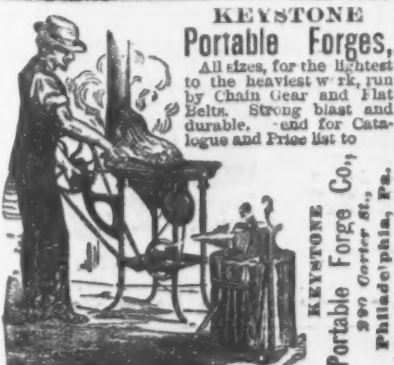
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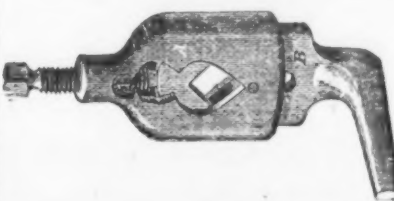
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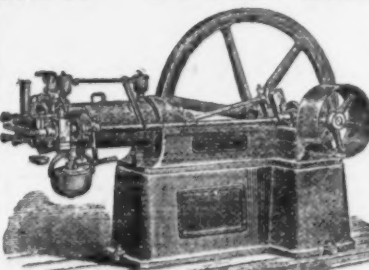
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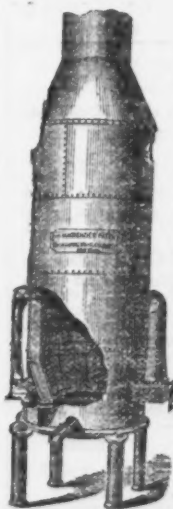
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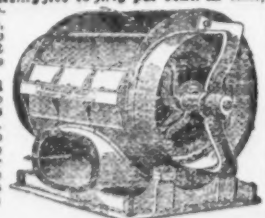
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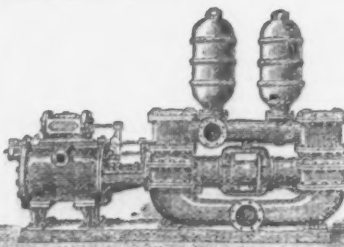
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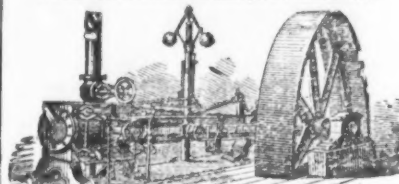
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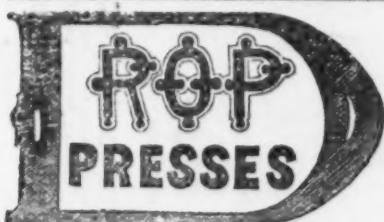
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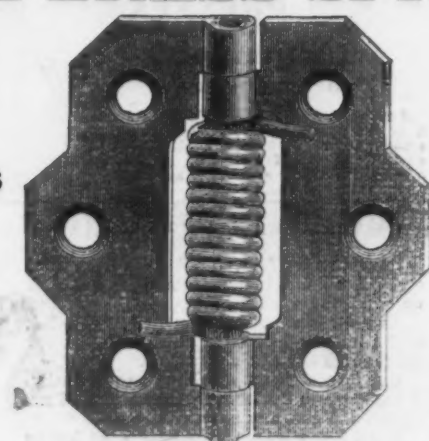
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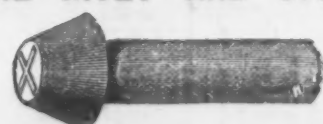
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